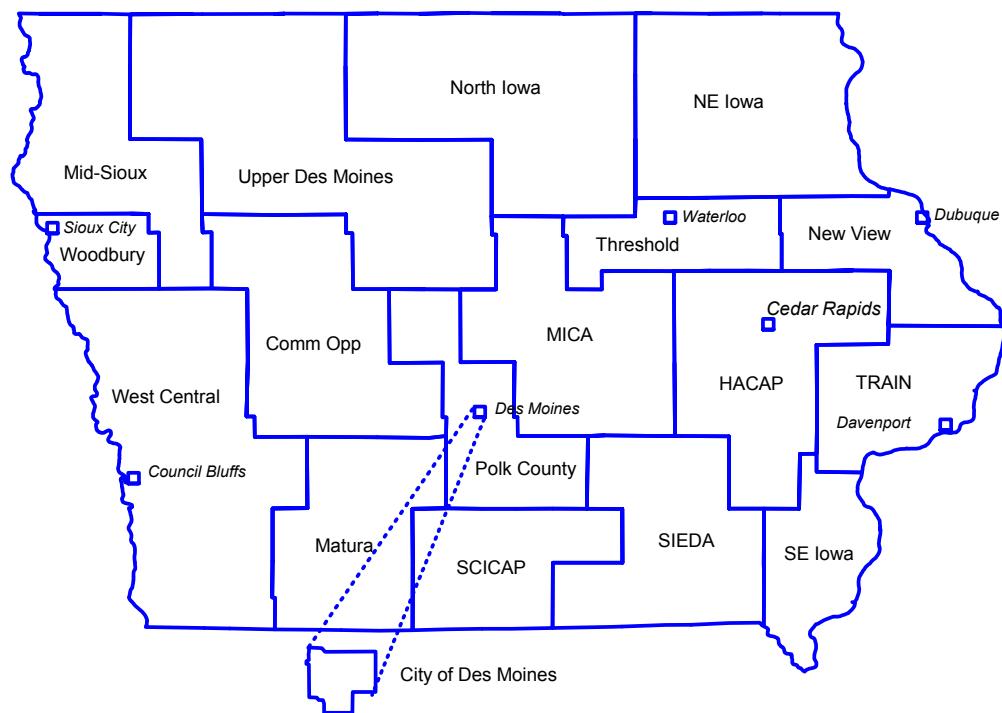


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# **REPORT ON IMPACTS AND COSTS OF THE IOWA LOW-INCOME WEATHERIZATION PROGRAM – Calendar Year 2003**

**October 19, 2004**

## **Iowa Community Action Agencies**



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**REPORT ON COSTS AND IMPACTS OF THE  
IOWA LOW-INCOME COLLABORATIVE  
WEATHERIZATION PROGRAM**

**Calendar Year 2003**

**October 19, 2004**

**Prepared for the  
Iowa Statewide Low-Income Collaborative**

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## 1. EXECUTIVE SUMMARY

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This report summarizes state and utility low-income weatherization program activity for households weatherized to completion during calendar year 2003. The report includes state, utility, and agency summaries of calendar year 2003 spending and impacts by measure, end-use, and fuel. The base data consisted of statewide program tracking databases of spending and measure installations for households completed during the calendar year 2003.

We estimated energy and coincident demand impacts for the program participants by adjustment factors to the engineering estimates that were developed for the 1992 program<sup>1</sup>. The gas and electric adjustment factors were derived from a series of fuel consumption analyses, including the 1992 and 1994 program participants. Gas adjustment factors were extended based upon fuel consumption analyses for completions during the period April, 1996 through March, 1997, September, 1998 through August, 1999, January through December, 2000 and 2001, August 2001 to August 2002, and September 2002 to September 2003. Refrigeration measure impacts were adjusted using the results of an electric fuel consumption analysis of January 2002 to January 2003 weatherization clients.

Utilities began funding incremental benefits for increasing the efficiency water heaters replaced for health and safety reasons. We assessed incremental savings for their expenditures. In addition, we developed estimates of savings that reflect the higher heating efficiency of new units that are free of scale buildup within the tank.

The impacts also reflect a revision of the diversified demand factors for electricity measures. The original factors were developed in 1992. The revised values reflect changes in system load factors due to mergers of utilities over the past decade.

### Program Costs and Impacts

The WAP program installed measures in 1,824 households during calendar year 2003: measures with direct energy savings were installed in all but five of these. Program expenditures for labor, materials, and support decreased by 8% compared to expenditures during 2002, totaling \$9.24 million in calendar year 2003. The average expenditure was \$5,064 per household compared with \$4,795 the previous year.

The measures installed by the program in 2003 are essentially unchanged from the 2002 program with two exceptions: capyslite bulbs are no longer being installed (compact fluorescent bulb installation rates increased as a result) and no water heater temperature reductions were performed. Notably, the installation frequency for high-efficiency heating replacement units (25%) now exceeds the rate for standard efficiency units (19%) for the first time in the history of the WAP program

The decrease in total funding (8%) combined with the increase in average expenditures (5%) resulted in 13% fewer households served, and reduced savings overall. First-year savings of natural gas totaled 437,603 therms -- a 14% decrease from 511,218 therms in CY 2002. First-year savings of electricity decreased by 22%, to 1,869,400 kWh from the 2,400,162 kWh in the CY 2002 program. About half of the decrease in electricity savings is attributable to downward adjustments of the refrigeration measure

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<sup>1</sup> see the following Wisconsin Energy Conservation Corporation reports for a full description of the estimation routines and derivation of the adjustment factors:

- [Estimated Low-Income Program Impacts in Iowa](#), June 14, 1993;
- [An Evaluation of Iowa's Low-Income Weatherization Efforts](#), August 8, 1994; and
- [An Evaluation of the 1995 Iowa Low-Income Collaborative Weatherization Program](#), November 5, 1996.

impacts. The installation rate for refrigeration measures continued to increase: 44% of households received refrigeration measures in the CY 2003 program compared to 36% of households in the previous year. Utility-funded measures were responsible for a higher percentage of energy and demand savings: 43% of all energy and demand savings for electricity (35% in CY 2002), and 41% of natural gas savings (37% in CY 2002).

In addition to utility-provided fuels, the CY 2003 program saved 59,678 gallons of propane. Fuel oil savings totaled 3,559 gallons in CY 2003.

First-year client energy cost savings totaled \$455,102. The average savings was \$250 per household, increasing slightly from \$247 per household in CY 2002.

On average, the program saved 1,031 kWh of electricity for 1,813 households with electricity impacts – this is an 11% decrease in the average electricity savings for households with electricity impacts. The program saved an average of 276 therms of natural gas for 1,814 households with gas impacts (essentially unchanged from CY 2002), 278 gallons of propane in 215 households with propane impacts, and 142 gallons of fuel oil in 25 households with fuel oil impacts.

Utilities contributed \$2.21 million in expenditures, or 24% percent of the total program expenditures. Utility-funded measures were installed in 1,214 households. Savings from utility-funded measures averaged 668 kWh in 1,196 utility-funded households with electricity impacts, and 173 therms in 1,037 utility-funded households with gas impacts (both values are essentially unchanged from CY 2002). Utility-funded measures yielded first-year client cost savings or \$169,191, averaging \$139 per household overall. Electricity savings averaged \$52 per household for utility-funded electricity measures, and \$103 for those receiving gas measures.

### **Fuel Consumption Analysis Results**

The natural gas savings reported herein have been adjusted at the agency level. The adjustment factors were derived from a fuel consumption analysis of recent program participants. The factors were applied to the estimated natural gas, propane, and fuel oil heating measures, and to natural gas and propane water heater measures. Along with providing better assessments of agency-level impacts, this procedure also provides a check on the accuracy of the algorithms used to estimate savings. The fuel consumption analysis showed 23.0% savings  $\pm$  1.0% at 90% confidence for natural gas measures installed in CY 2003.

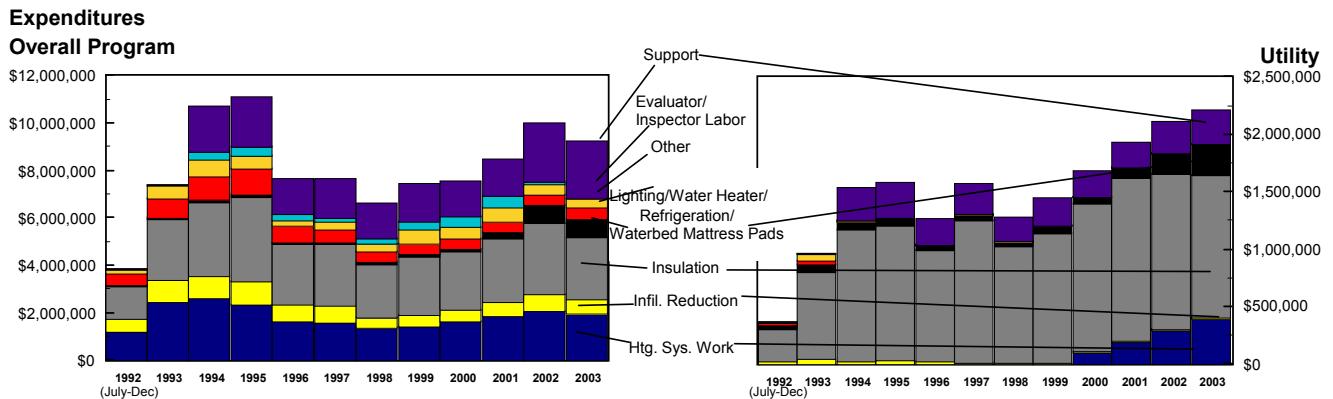
A fuel consumption analysis was conducted to assess savings for refrigeration measures for the CY 2002 program participants. Observed savings were approximately 64% of those determined in the pilot program evaluation. Measure-specific realization rates were developed for refrigerator exchanges, freezer exchanges, and removed appliances. Refrigerator and freezer exchanges averaged 869 kWh and 662 kWh, respectively after the adjustments. Appliance removals averaged 1,022 kWh and 713 kWh for refrigerator and freezer removals, respectively after the adjustments.

### **Changes in Reporting**

The content of the report and data sources are similar to previous years, with the exceptions that refrigeration measures savings were adjusted based upon results of the electricity fuel consumption analysis.

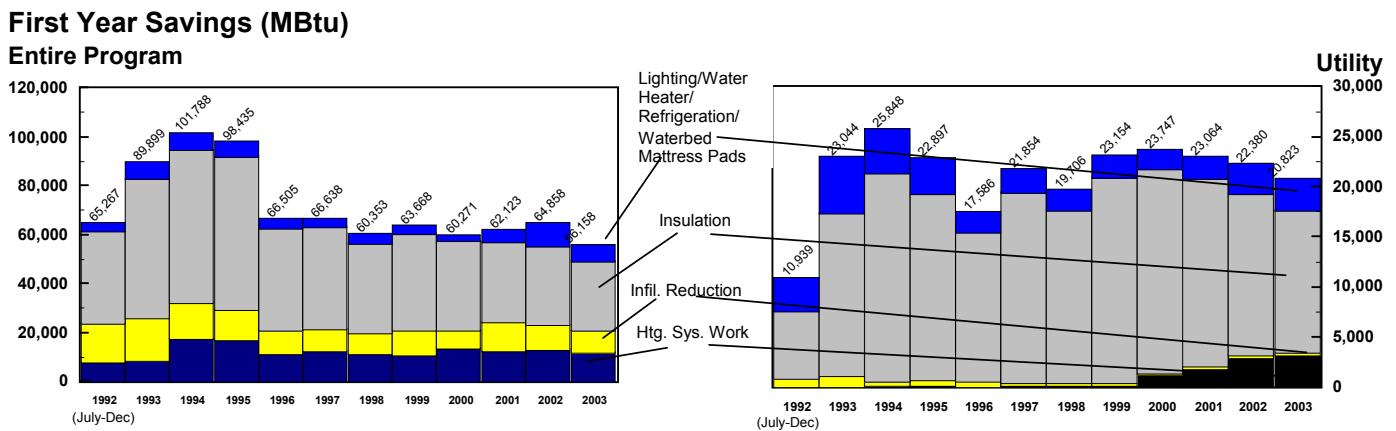
## 2. SUMMARY OF PROGRAM IMPACTS AND EXPENDITURES

Program spending totaled \$9,236,687 for materials, labor, and support in houses weatherized to completion during calendar year 2003, down by 7.8% from \$10,017,085 in 2002 (see Figure 2.1, totals exclude administration expenditures). The number of households weatherized in 2003 decreased by 12.8%, from 2,089 in 2002 to 1,864 in 2003. Utility expenditures totaled \$2,209,638, a 4.6% increase from expenditures of \$2,108,654 in 2002.

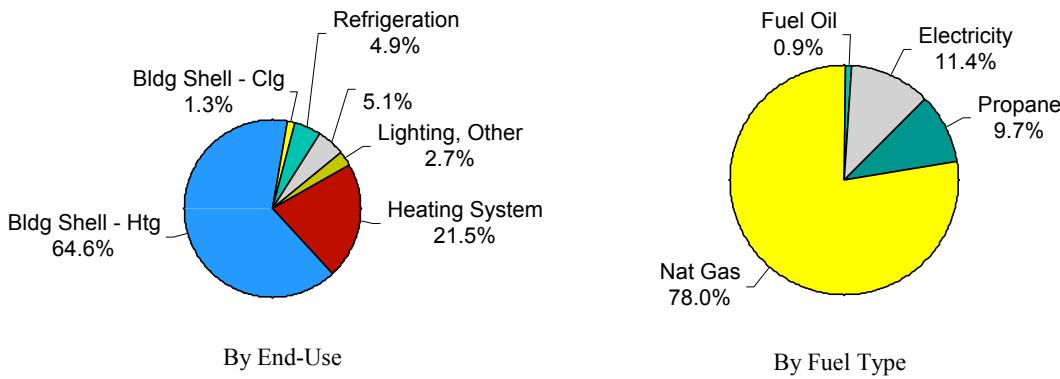


**Figure 2.1 Overall program and utility spending.**

The reduction in total households weatherized and adjustments to refrigeration measure savings translated into a 13% reduction in aggregate program energy savings, from 64,859 MBtu in 2002 to 56,156 MBtu in 2003 (Figure 2.2.) Utility-funded energy savings decreased by 7.0% to 20,823 Mbtu in 2003, mostly attributable to the downward adjustments in refrigeration measure savings.



**Figure 2.2 Overall program and utility energy savings.**

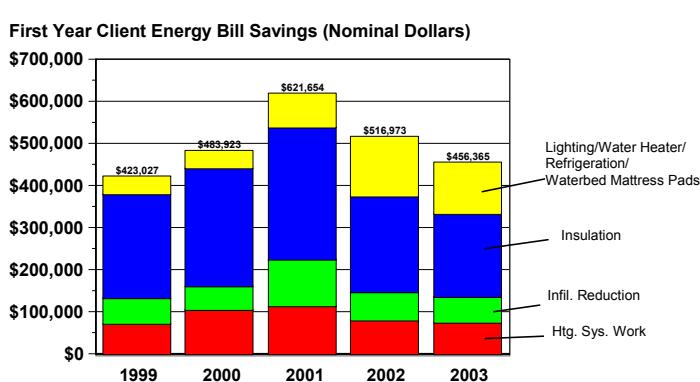


Total of 56,156 MBtu savings, average of 30.8 MBtu per household.

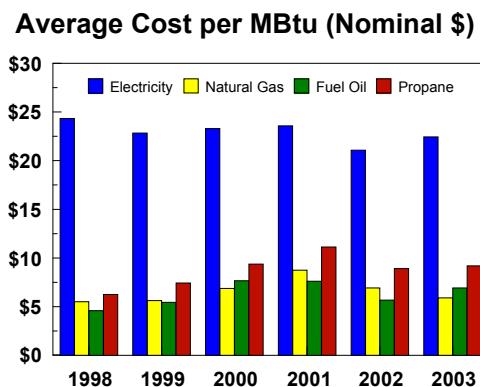
**Figure 2.3. Overall energy savings by end-use and fuel type.**

The 2003 program saved an average of 30.8 MBtu per household (Figure 2.3.) In fuel units, first-year savings totaled 437,603 therms of natural gas, 1,869,400 kWh of electricity, 59,678 gallons of propane, 3,559 gallons of fuel oil. On an Mbtu basis, natural gas savings continues to dominate savings at 78%. Electricity savings accounted for 11.4% of savings on an Mbtu basis in the CY 2003 program, and propane savings accounted for 9.7%.

Nominal total first year client energy bill savings declined from \$516,973 in 2002 to \$456,365 in 2003 (Figure 2.4a.), in proportion to the number of households served. The average first year client bill savings increased slightly, from \$247 in 2002 to \$250 in 2003.



**Figure 2.4a First-year client cost savings by year.**

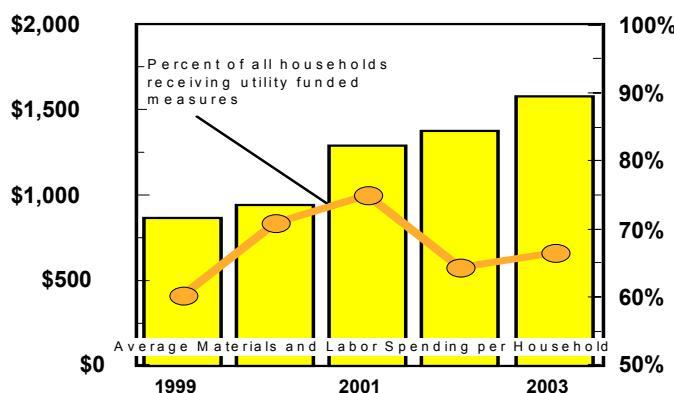


**Figure 2.4b Average fuel costs**

### **Utility Funding Impacts**

Utility funding totaled \$2,209,638, which represents a 4.5% increase from \$2,108,654 spent during 2002. Utility expenditures accounted for 24% of the total low-income program expenditures, up from 21% in 2002.

Utility funding reached 1,214 households, or 67% of all households treated by the program, up slightly from 64% in 2002. The average utility expenditure for materials and labor was \$1,579 for households receiving these measures: the average increased by 13% from \$1,373 in CY 2002 (Figure 2.5.) Utility support expenditures averaged an additional \$241 per household receiving utility-funded measures.



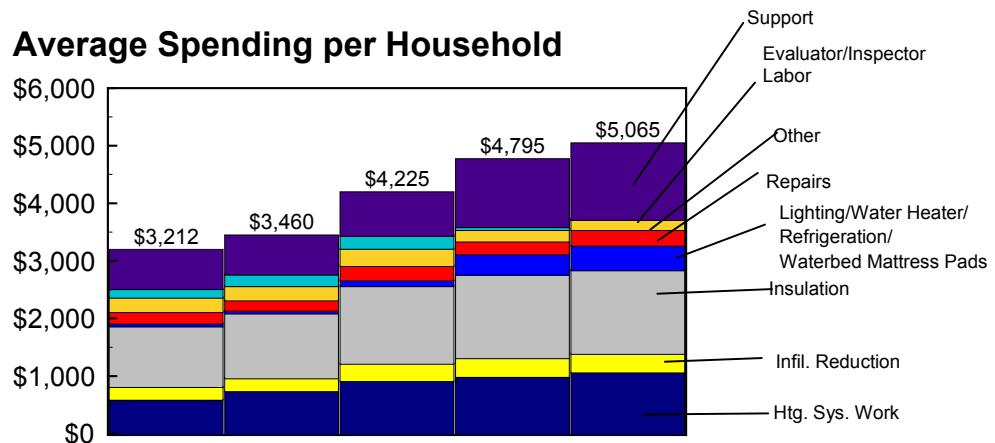
**Figure 2.5. Penetration and average utility spending.**

Utility-funded measures accounted for 37% of MBtu savings in 2002 compared to 35% in 2002. These measures were responsible for 44% of all energy and demand savings for electricity and 41% of gas savings. Utility-funded measures saved an average of 690 kWh of electricity for the 1,196 households with utility-funded electricity measures, compared with an average of 648 kWh in 2002. These measures saved 173 therms of natural gas for the 1,037 households with utility-funded natural gas measures, also essentially unchanged from an average of 172 therms in 2002. In aggregate, utility-funded measures installed in 2003 reduced peak electricity demand by 145 kW in the summer and 158 kW in the winter, and provided 1,853 peak-day therms of gas savings.

Utility-funded measures yielded first-year client cost savings of \$169,190, averaging \$139 per household overall. Electricity savings averaged \$52 per household for utility-funded measures, and \$103 for gas measures.

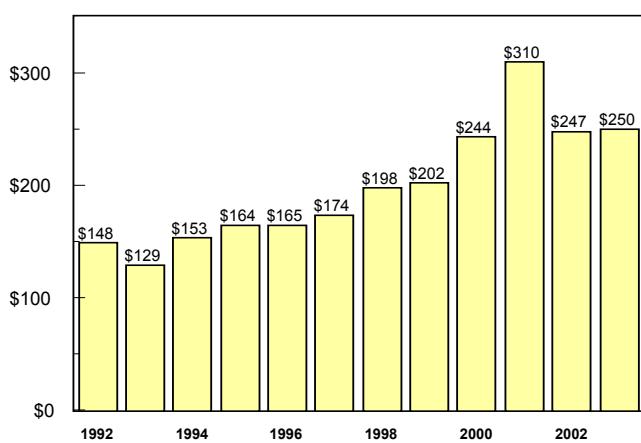
### **Average Household Expenditures and Impacts**

Average household expenditures increased by 5.6% to \$5,065 from \$4,795 in 2002 (Figure 2.6.) Insulation accounted for the largest proportion of total expenditures, followed by heating system work and support.



**Figure 2.6. Average spending per household.**

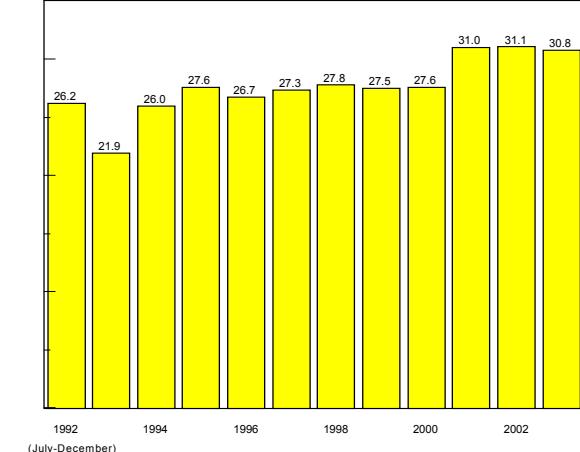
**Annual Client Energy Cost Savings (Nominal Dollars)**



NOTE: Average values for households receiving energy measures.

**Figure 2.7. Client energy cost savings by end-use.**

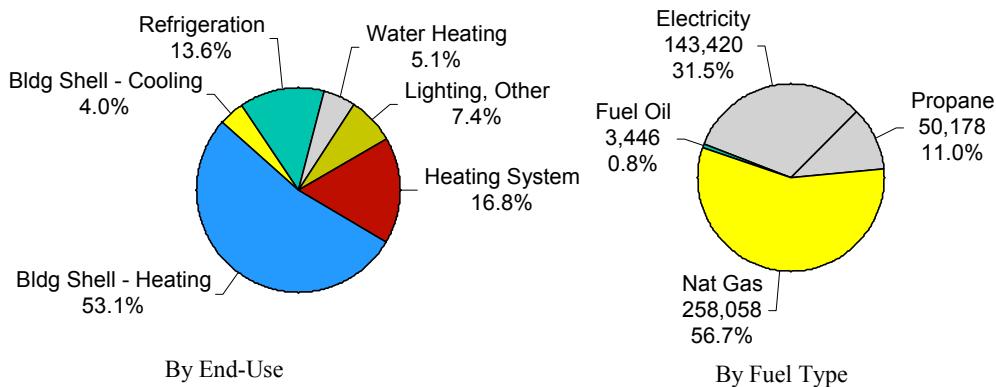
**Average Annual Energy Savings (MBtu)**



**Figure 2.8. Average household annual energy savings.**

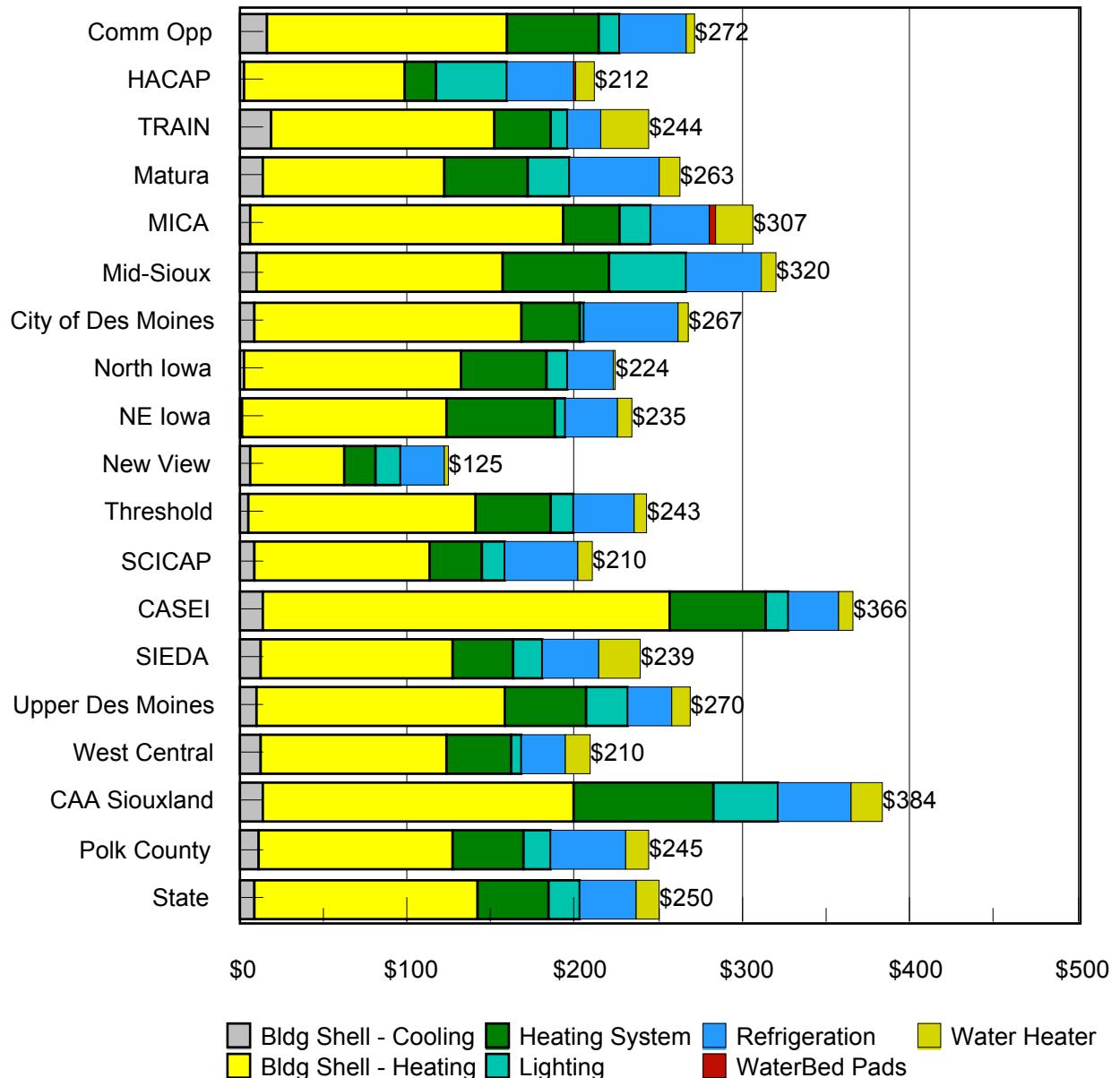
First-year client fuel bill savings were \$250 for households receiving energy savings measures for the CY 2003 program (Figure 2.7). Household average savings dropped slightly to 30.8 MBtu for clients weatherized during 2003 (Figure 2.8).

The vast majority of client energy cost savings is attributable to space heating savings, which accounted for about 70% of total client energy cost savings (Figure 2.9.) Refrigeration measures accounted for 14% of the energy cost savings. Electricity cost savings now accounts for about 32% of all client fuel bill savings.



Total of \$455,102 in first-year client bill savings, average of \$250 per household.

**Figure 2.9. Overall client fuel bill savings by end-use and fuel type.**



**Figure 2.10. Average annual energy cost savings per household with energy savings**

Figure 2.10 shows the average annual energy cost savings by agency. The series are arranged from left to right in the bar according to top to bottom and left to right in the legend, e.g., Bldg Shell Cooling, then Bldg Shell Heating, then Heating system, etc.

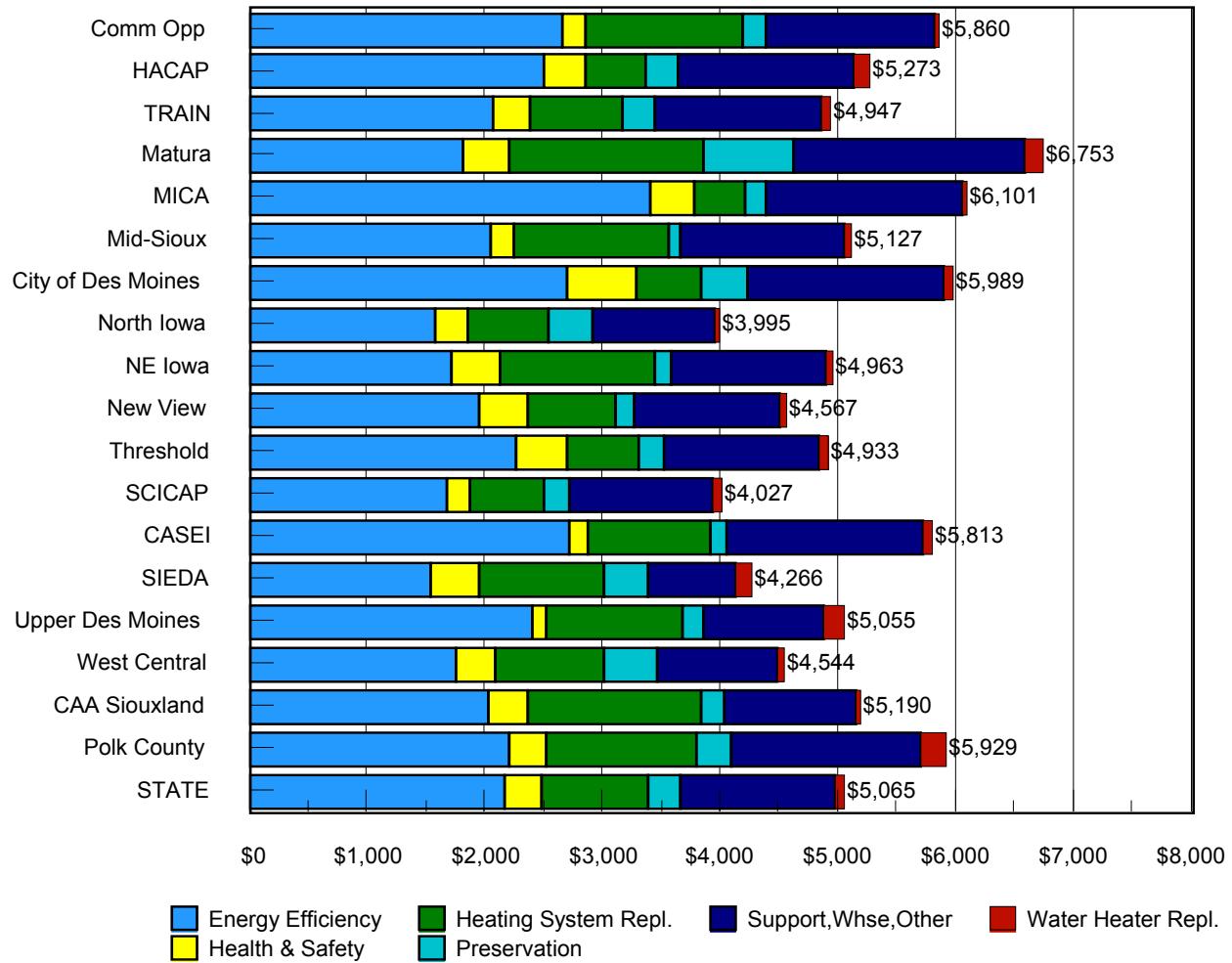
The natural gas savings attained by each agency were adjusted according to results of the natural gas and electricity fuel consumption analyses (see Section 3, Assessment of Agency-Specific Adjustment Factors). A fuel consumption analysis was not run for electricity or deliverable fuels (propane, fuel oil, and other fuels).

The average first-year client bill savings was widely varied across agencies, from lows of \$125 per household (New View) to a highs of \$366 for CASEI (formerly known as SE Iowa) and \$384 for Siouxland (formerly Woodbury County).

Note that a number of factors affect the values shown in this chart, factors beyond quality or intensity of weatherization treatment. Consequently, these results should not be used as a basis for comparing the quality, attention to detail, dedication, or other factors of agency performance.

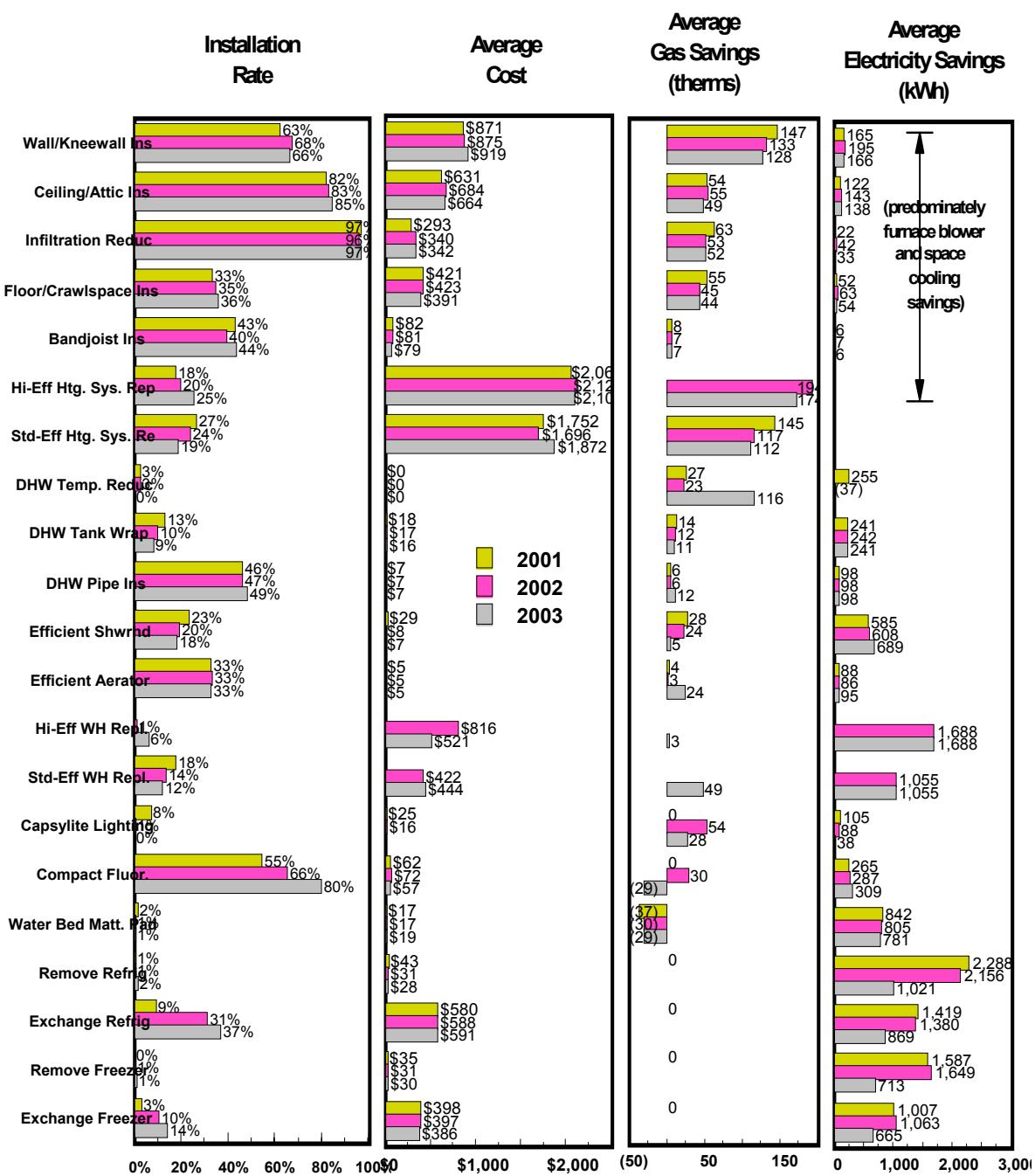
The major reasons for variations in average client cost savings include:

- regional variations in levels of pre-existing insulation which reduces savings potential for northern and central region households (see the report on the report of the 1997 weatherization program for details)
- differences in fuel costs -- utility rates vary from one utility to another and some agencies serve a greater percentage of rural clients who often rely upon the more expensive deliverable fuels for heating and water heating;
- climate variations across the state mean that some agencies may see greater heating (and cooling) fuel savings than others.
- differences in the average size of the houses treated -- agencies that treat larger (but fewer) houses will have higher average savings per house.



**Figure 2.11. Average spending across all households.**

Figure 2.11 shows the average expenditures for all households in 2003. Matura and MICA each averaged over \$6,000 per dwelling. North Iowa's average expenditures was lowest at \$3,995, but was up considerably more than CY 2002 levels, at \$2,967 per dwelling. The statewide average expenditure was \$5,065 per dwelling.



Note: all averages are per household that received the measure

**Figure 2.12. Installation frequencies, average costs, and average energy savings.**

The average installation rates, costs, and savings for energy efficiency measures for 2001-2003 are shown in Figure 2.12. Note that for 2003, the average savings for refrigeration measures reflects the billing analysis adjustments to savings: the CY 2001 and 2002 estimates were based upon average savings from the pilot program (see Section 3 for further discussion).

Table 2.1 shows the average installation rates of all measures, from 1992 through 2003.

**Table 2.1. Percentage of houses receiving measures**

Measure	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b><i>Insulation and Infiltration Reduction Measures</i></b>												
Wall/Kneewall Insulation	48	53	52	57	59	59	56	51	53	63	68	66
Ceiling/Attic Insulation	73	72	71	72	72	73	72	69	74	82	83	85
Infiltration Reduction	87	86	82	84	86	87	89	84	82	97	96	97
Floor/Crawlspace Insulation	30	29	30	32	34	33	32	29	30	33	35	36
Bandjoist Insulation	44	42	41	42	43	41	39	32	35	43	40	44
Damming Material	Na	Na	Na	Na	Na	5	24	28	31	33	0	0
Unspecified Insulation	14	3	0	0	14	38	52	60	67	76	73	74
<b><i>Heating System Measures</i></b>												
Htg. Sys. Replacement	26	21	26	28	30	33	31	29	39	44	44	44
High Eff Htg Sys Repl	Na	Na	Na	5	4	6	7	5	8	18	20	25
Std/Unspec Eff Htg Sys Repl	Na	Na	Na	23	26	26	24	24	31	26	24	19
Htg. Sys. Tune and Clean	61	63	63	64	66	61	59	53	52	63	62	62
Heating System Safety Check	Na	Na	33	46	47	45	55	55	60	25	35	28
Htg. Sys. Other	35	59	37	37	31	30	29	15	7	25	43	46
Duct Insulation	Na	Na	1	2	2	3	2	2	2	2	0	0
Duct Sealing	Na	Na	41	30	26	22	20	23	23	28	58	57
<b><i>Water Heater Measures</i></b>												
Water Heater Turndown	11	7	11	11	11	9	10	4	3	3	3	0
Water Heater Wrap	18	20	26	27	21	14	15	12	10	13	10	9
Pipe Wrap	24	27	41	49	43	40	44	38	40	46	47	49
Shower Head	12	16	22	23	20	18	19	18	14	23	20	18
Faucet Aerator	23	30	41	43	33	30	31	27	27	32	33	33
Water Heater Replacement										15	19	
Std-Eff Wtr Htr Repl.										14	12	
Hi-Eff Wtr Htr Repl.										1	6	
Water Heater Repair	11	5	10	23	20	14	11	14	20	18	7	13
<b><i>Lighting Measures</i></b>												
Capsylite Bulbs	15	16	18	15	14	13	11	7	8	8	1	0
Compact Fluorescent Bulbs	13	25	24	28	24	28	31	39	47	55	66	80
<b><i>Water Bed Mattress Pads</i></b>												
	Na	Na	2	5	4	3	1	2	2	2	1	1
<b><i>Refrigeration Measures</i></b>												
Refrigerator Removal	Na	1	1	2								
Refrigerator Exchange	Na	9	31	37								
Freezer Removal	Na	0	1	1								
Freezer Exchange	Na	3	10	14								
<b><i>Health and Safety (other than heating &amp; water heating measures listed above)</i></b>												
Asbestos Abatement	Na	Na	2	0	0	1	1	0	0	0	0	1
CO Detector	Na	Na	Na	1	4	15	22	24	29	33	30	34
Smoke Detector	Na	Na	0	1	2	3	4	5	7	0	6	9
Exhaust Ventilation	Na	Na	1	2	26	36	36	35	38	57	47	48
Fuses	Na	Na	Na	Na	Na	0	1	0	0	0	0	0
<b><i>Support and Evaluator/Inspector Labor</i></b>												
Evaluator Labor	Na	Na	52	60	69	38	44	82	91	94	30	Na
Inspector Labor	Na	Na	39	57	64	33	50	74	84	94	29	Na
Evaluator/Inspector Labor	Na	1	0	Na								
Support	Na	Na	95	97	97	98	98	98	98	100	99	94
<b><i>Other</i></b>												
Repairs	82	83	76	80	80	75	73	68	70	80	80	85
Consumables	43	41	31	32	36	31	36	28	27	20	26	26
Unknown	1	12	11	0	0	0	0	5	3	1	1	1

Note: Refrigeration measures were phased in beginning the second half of 2001.

The installation rates has changed very little for most major heating/cooling measures. Installation rates of insulation has leveled out at levels of around 65% for wall/kneewall insulation and around 83% for ceiling/attic insulation. Heating system replacements have been installed in 44% of dwellings for the third straight.

Of note is the transition from standard to high-efficiency heating system replacements: CY 2003 showed 5% more installations of high efficiency heating systems and 5% fewer standard efficiency replacements. The installation frequency for high-efficiency heating replacement units (25%) now exceeds the rate for standard efficiency units (19%) for the first time in the history of the WAP program.

Refrigeration measures were installed in 44% of homes in 2003, compared with 36% in 2002. Refrigerator and freezer exchanges accounted for most of the increase, rather than removals. Refrigerator exchanges were installed in 37% of dwelling in 2003, compared with 31% for 2002. Installation rates for freezer exchanges also increased, from 10% in 2002 to 14% in 2003.

Water heater replacements increased to 18% of dwelling in 2003, compared to 15% in 2002. One-third of replacement units were high-efficiency water heaters. No water heater turndowns were performed during 2003, but the installation rates of other water heater measures remained roughly unchanged from 2002.

Compact fluorescent bulbs now comprise 100% of replacement bulbs. The installation rate of lighting measures jumped from 66% in 2002 to 80% in 2003.

#### Savings of Water Heater, Lighting, and Refrigeration Measures

Table 2.2 shows the installation rates for energy efficiency measures not specifically addressed by the NEAT audit as used in Iowa. These measures include water heater (except water heater replacements which are primarily health and safety measures), lighting, waterbed mattress pads, and refrigeration measures.

Statewide, client bill savings averaged \$61 for these measures: this is down from \$64 in CY 2002, but the primary reason remains in the correction for overestimates of refrigeration measure savings in 2002. These measures accounted for 24% of first-year client bill savings in CY 2003.

The highest average bill savings were attained by CAA Siouxland (formerly Woodbury) and Mid-Sioux, averaging just over \$100 per household. The average savings for these measures in households served by North Iowa remain one of the lowest in the state at \$40, but this agency showed marked improvement over the previous year where savings averaged only \$23 per dwelling. Polk County showed an even greater improvement, more than tripling the average savings for these measures from \$22 in 2002 to \$68 in 2003.

**Table 2.2 Installation rates of non-space-conditioning measures**

Agency	Water Heater Measures					Lighting		Refrigeration				Average First Year Bill Savings	
	Tank Wrap	Pipe Wrap	Eff Shower-head	Eff Faucet Aerator	Temp Reduc	Cap-sylite	Compact Fluor	Waterbed Mattress Pad	Ex-change Refrig	Ex-change Freezer	Remove Refrig	Remove Freezer	
	0%	98%	9%	0%	0%	0%	70%	0%	34%	11%	11%	2%	\$56.02
Comm Opp	4%	36%	25%	42%	0%	0%	99%	1%	46%	13%	1%	1%	\$88.56
TRAIN	39%	61%	48%	81%	0%	0%	100%	0%	26%	5%	0%	0%	\$50.75
Matura	0%	0%	0%	0%	0%	0%	85%	0%	55%	23%	5%	3%	\$78.29
MICA	0%	78%	44%	66%	0%	0%	95%	12%	41%	13%	0%	0%	\$76.94
Mid-Sioux	26%	23%	0%	0%	0%	0%	95%	0%	28%	23%	11%	8%	\$103.40
City of Des Moines	1%	41%	2%	3%	0%	0%	12%	0%	58%	15%	6%	1%	\$59.32
North Iowa	0%	2%	0%	2%	0%	0%	82%	0%	29%	23%	0%	2%	\$39.59
NE Iowa	9%	85%	2%	7%	0%	0%	92%	0%	35%	24%	4%	2%	\$42.25
New View	6%	3%	1%	1%	0%	0%	97%	0%	43%	10%	0%	4%	\$42.00
Threshold	0%	86%	0%	0%	0%	0%	84%	0%	42%	12%	0%	0%	\$51.81
SCICAP	0%	17%	0%	0%	0%	0%	54%	0%	48%	15%	2%	0%	\$54.51
CASEI	0%	0%	0%	0%	0%	0%	88%	0%	33%	16%	0%	0%	\$44.15
SIEDA	7%	79%	41%	72%	0%	0%	87%	1%	38%	14%	0%	0%	\$64.68
Upper Des Moines	0%	44%	0%	42%	1%	0%	92%	0%	37%	0%	0%	0%	\$52.91
West Central	5%	69%	36%	79%	1%	0%	52%	0%	24%	16%	0%	0%	\$46.25
CAA Siouxland	39%	82%	35%	0%	0%	0%	91%	0%	36%	27%	2%	2%	\$105.26
Polk County	0%	95%	31%	76%	0%	0%	64%	0%	51%	24%	0%	0%	\$68.26
State	9%	51%	18%	34%	0%	0%	81%	1%	38%	14%	2%	1%	\$60.70

(1) First-year household bill savings are averages of total water heater, lighting, and waterbed mattress pad savings for

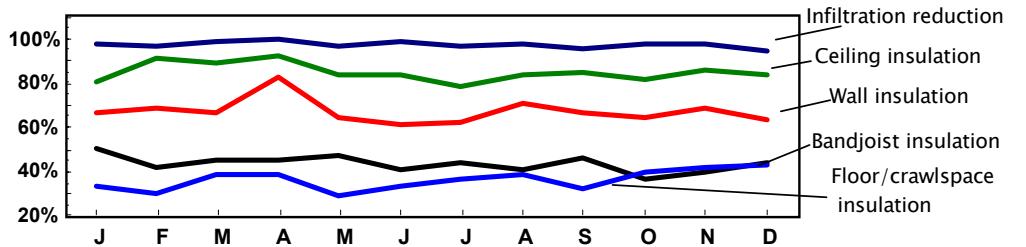
Table 2.3 shows that average installed costs for each measure (average costs are computed for households that received the specific measures, not across all households treated by the program.)

The average installed costs of major measures tended to fluctuate within a few percent of the costs seen in the CY 2002 program. The notable exception is for standard efficiency heating system replacements, which increased by about 10%. Also of note, the average cost for high-efficiency water heaters dropped from \$816 in CY 2002 to \$521 CY 2003.

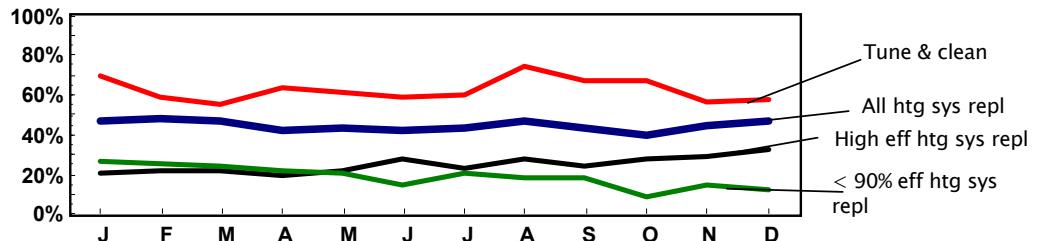
**Table 2.3. Average measure costs**

Measure	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b><i>Insulation and Infiltration Reduction Measures</i></b>												
Wall/Kneewall Insulation	449	537	668	805	807	819	826	846	831	871	875	919
Ceiling/Attic Insulation	338	370	438	516	522	543	558	573	592	631	684	664
Infiltration Reduction	264	264	285	317	337	310	248	264	281	294	340	342
Floor/Crawlspace Insulation	127	150	274	332	365	315	350	408	407	421	423	391
Bandjoist Insulation	45	55	63	66	68	71	75	79	77	82	81	79
Damming Material	Na	Na	Na	Na	Na	29	35	34	28	28	0	0
Unspecified Insulation	211	165	151	10	142	121	129	143	140	144	146	142
<b><i>Heating System Measures</i></b>												
Htg. Sys. Replacement	1,549	1,894	1,973	1,840	1,720	1,665	1,739	1,809	1,815	2,470	1,893	1,989
High Eff Htg Sys Repl	Na	Na	Na	1,706	2,213	1,929	1,830	2,059	1,959	2,063	2,129	2,103
Std/Unspec Eff Htg Sys Repl	Na	Na	Na	2,418	1,641	1,604	1,712	1,751	1,781	1,727	1,696	1,872
Htg. Sys. Tune and Clean	65	78	88	86	76	73	77	80	75	77	82	80
Heating System Safety Check	Na	Na	101	74	46	50	53	119	144	266	69	75
Htg. Sys. Other	130	161	172	182	210	229	248	326	251	266	281	269
Duct Insulation	Na	Na	90	107	103	105	125	74	100	76	0	0
Duct Sealing	Na	Na	219	165	157	149	126	156	142	153	96	83
<b><i>Water Heater Measures</i></b>												
Water Heater Turndown	0	0	0	0	0	0	0	0	0	0	0	0
Water Heater Wrap	16	19	22	20	18	20	19	19	18	18	17	16
Pipe Wrap	6	5	7	8	6	6	6	7	6	7	7	7
Shower Head	6	7	8	8	8	9	8	8	7	29	8	7
Faucet Aerator	4	4	8	7	5	6	5	5	5	5	5	5
Water Heater Replacement	Combined with water heater repair										422	444
Std-Eff Wtr Htr Repl.											816	521
Hi-Eff Wtr Htr Repl.												
Water Heater Repair	355	360	162	170	148	224	252	265	240	328	85	137
<b><i>Lighting Measures</i></b>												
Capsylite Bulbs	23	21	22	24	23	24	25	22	22	25	16	0
Compact Fluorescent Bulbs	15	20	23	27	41	47	70	66	58	62	74	48
<b><i>Water Bed Mattress Pads</i></b>	Na	Na	2	5	4	3	1	2	2	2	17	19
<b><i>Refrigeration Measures</i></b>												
Refrigerator Removal	Na	Na	Na	Na	Na	Na	Na	Na	Na	43	31	28
Refrigerator Exchange	Na	Na	Na	Na	Na	Na	Na	Na	Na	589	588	591
Freezer Removal	Na	Na	Na	Na	Na	Na	Na	Na	Na	40	31	30
Freezer Exchange	Na	Na	Na	Na	Na	Na	Na	Na	Na	410	397	386
<b><i>Health and Safety (other than heating &amp; water heating measures listed above)</i></b>												
Asbestos Abatement	Na	Na	307	1,139	729	500	529	648	0	0	849	772
CO Detector	Na	Na	Na	44	60	60	56	55	51	50	53	53
Smoke Detector	Na	Na	110	20	38	27	31	33	25	0	25	29
Exhaust Ventilation	Na	Na	42	53	66	65	74	73	79	187	89	116
Fuses	Na	Na	Na	Na	Na	21	35	35	28	0	23	33
<b><i>Support and Evaluator/Inspector Labor</i></b>												
Evaluator Labor	Na	Na	111	100	84	88	114	105	111	132	151	Na
Inspector Labor	Na	Na	70	89	78	72	104	91	99	120	95	Na
Evaluator/Inspector Labor	Na	Na	Na	Na	Na	Na	Na	Na	Na	440	0	Na
Support	Na	Na	501	580	606	672	709	690	699	754	1,178	1,405
<b><i>Other</i></b>												
Repairs	235	244	319	381	342	287	298	292	279	296	275	318
Consumables	29	31	42	25	29	23	27	13	15	14	16	20

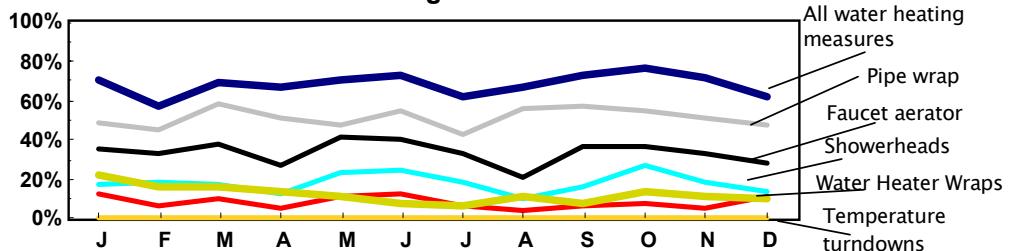
### Installation rates of insulation and infiltration reduction measures



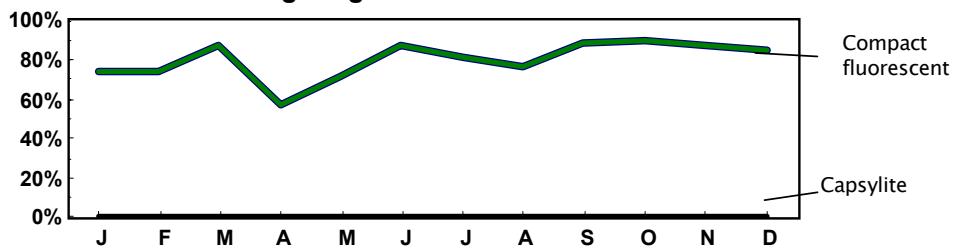
### Installation rates of heating system work



### Installation rates of water heating measures



### Installation rates of lighting measures



### Installation rates of refrigeration measures

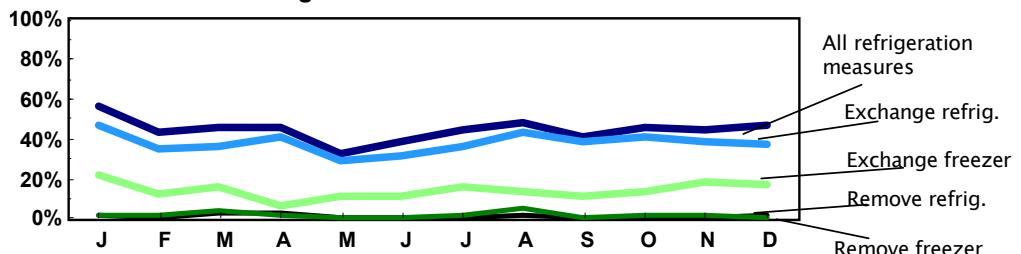


Figure 2.13 shows the month-to-month installation rates for major energy measures and for lighting and water heating measures. Most measures showed relatively flat installation rates, with the exception of the April/May period: this is the timeframe when the new agencies are in transition between WAP program years. Installation rates for high-efficiency furnace replacements overtook standard-efficiency units beginning in April.

### **Major Measure Costs by Agency**

Figures 2.14-2.21 show the agency-specific average costs for ceiling, wall, and floor/crawl space insulation and furnace replacements for the overall program and for utility-funded measures only. These costs represent the total expenditures for these measures averaged over the number of households that received the measure (as opposed to an average across all households that were treated by the agency).

#### Ceiling Insulation Expenditures

Figures 14 and 15 show the average installed costs for ceiling insulation. The statewide average cost for ceiling insulation was \$664 in 2003 as compared to \$684 in 2002. Community Opportunity was the only agency with an average cost exceeding \$1,000, at \$1,059. The average expenditures were lowest for SIEDA at \$437 per dwelling and NE Iowa at \$464.

The average expenditures for SCICAP dropped substantially, from \$1,145 in 2002 to \$919 in 2003. CAA Siouxland, formerly Woodbury County, shows a three year trend in lowered average costs, from \$738 in 2001 down to \$578 in 2003.

Figure 15 shows the statewide average expenditure of *utility funds* on ceiling insulation was \$513 in 2003, down from \$538 the previous year. The average expenditures by SCICAP dropped dramatically, from \$1,064 per dwelling in 2002 to \$779 in 2003. Community Opportunity continues a three year trend of increasing expenditures of utility money for ceiling insulation, from \$525 in 2001 to \$766 in 2003.

#### Wall Insulation Expenditures

Figures 16 and 17 show the average installed costs for wall insulation. The overall average expenditure for wall insulation was increased from \$875 in CY 2002 to \$919 in 2003. MICA showed a large increase in average expenditures, from \$948 in 2002 to \$1,450 in 2003. Average expenditures by Community Opportunity dropped substantially, from a high of \$1,612 in 2002 to \$1,274 in 2003.

Sieda continues a trend of increased average costs, from \$366 in 2001 to \$563 in 2003. SCICAP had the lowest average expenditure in 2003 at \$376 per dwelling.

Statewide, the average expenditures for *utility-funded* wall insulation was up slightly, from \$740 in 2002 to \$745 in 2003. MICA nearly doubled the average expenditures from \$684 in 2002 to \$1,245 in 2003. No other agency averaged expenditures over \$1,000 per dwelling for utility-funded wall insulation. SCICAP, New View, and Matura each averaged \$425 or less for utility-funded wall insulation expenditures in 2003.

#### Floor/Crawl Space Insulation Expenditures

Figures 18 and 19 show average expenditures for floor/crawl space insulation in CY 2003. Statewide, the cost for floor/crawl space insulation averaged \$391, down from \$423 in 2002. HACAP spent the most, at \$646 per dwelling and North Iowa (\$175) spent the least on average. At \$663 per dwelling, HACAP averaged the greatest expenditures of *utility funds*, and CASEI (\$119) spent the least.

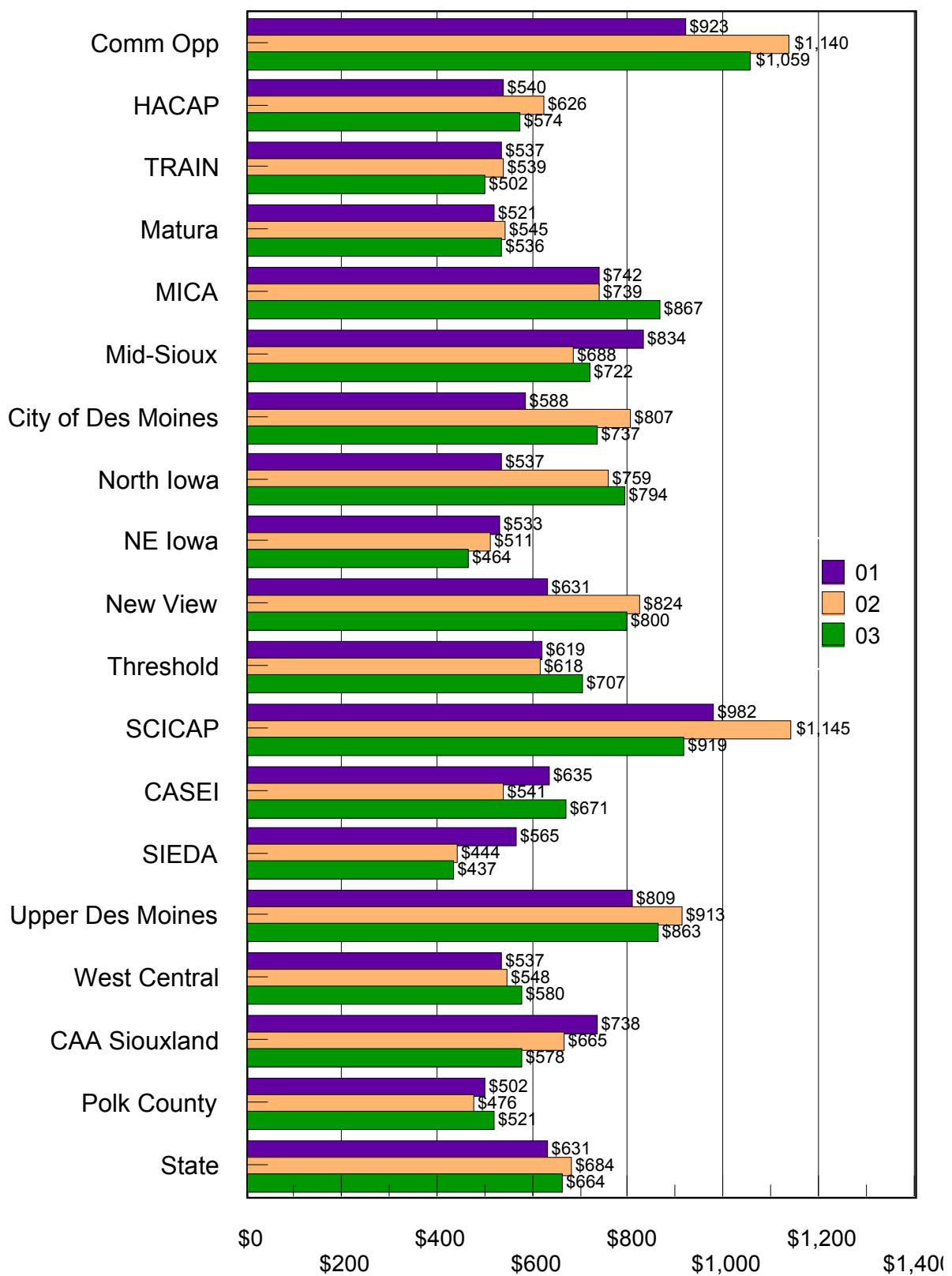
#### Furnace Replacement Expenditures

Figures 20 and 21 show average expenditures for furnace replacements. Statewide average furnace replacement costs increased to \$1,991 in 2003 from \$1,894 the previous year. (Figure 2.20). On average, NE Iowa and CAA Siouxland spent the most, at \$2,582 and \$2,722 respectively: MICA (\$1,448) and City of Des Moines (\$1,486) spent the least.

All agencies reported *utility-funded* furnace replacements for households with weatherization completed during that year. Figure 2.21 shows the average utility funding for replacement heating systems. The average expenditure of utility funds was \$1,792.

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### Average Cost of Ceiling Insulation -- Dollars per Treated House



**Figure 2.14. Average ceiling insulation costs by agency.**

### Average Cost of Ceiling Insulation -- Utility Dollars per Treated House

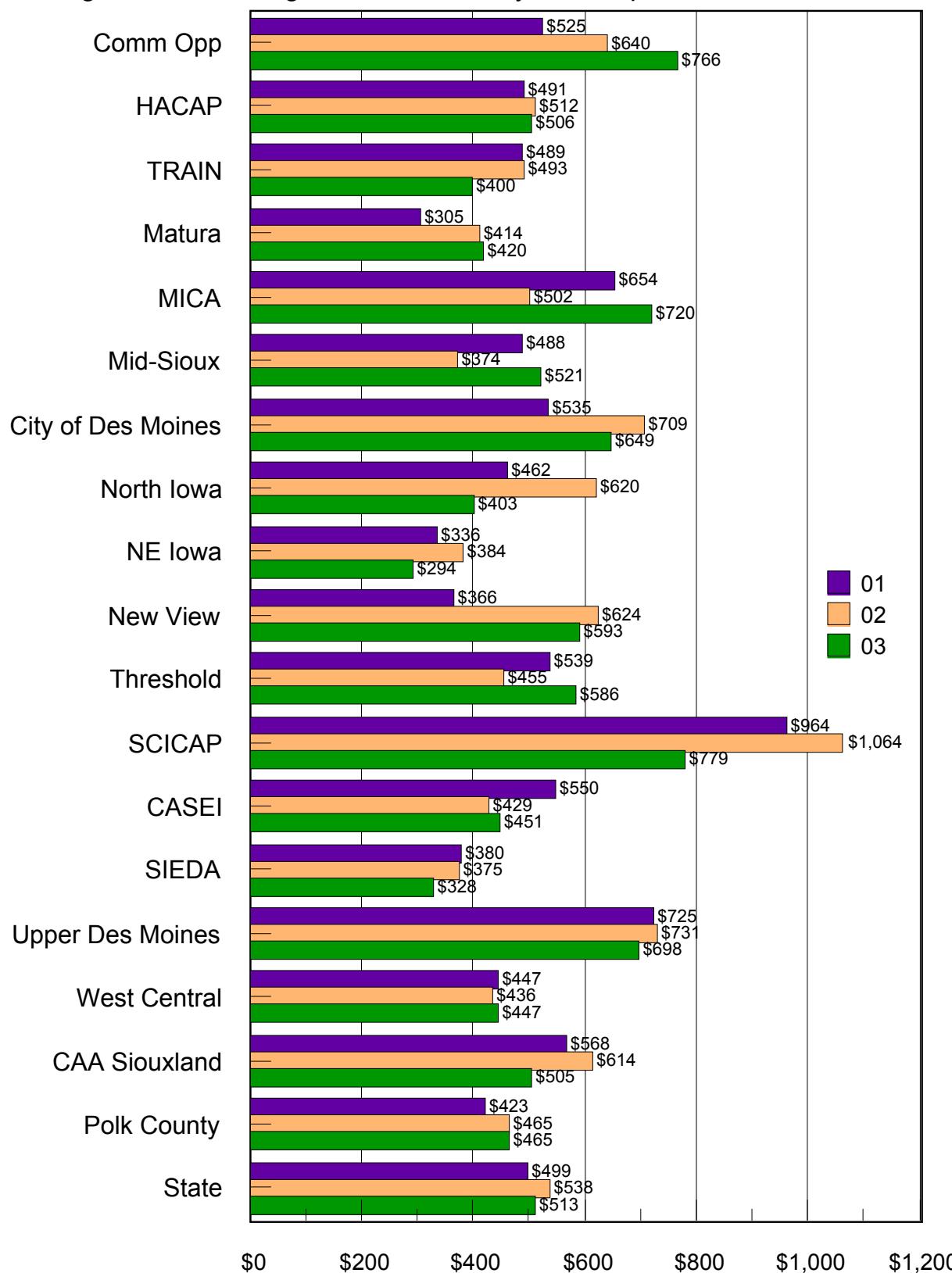
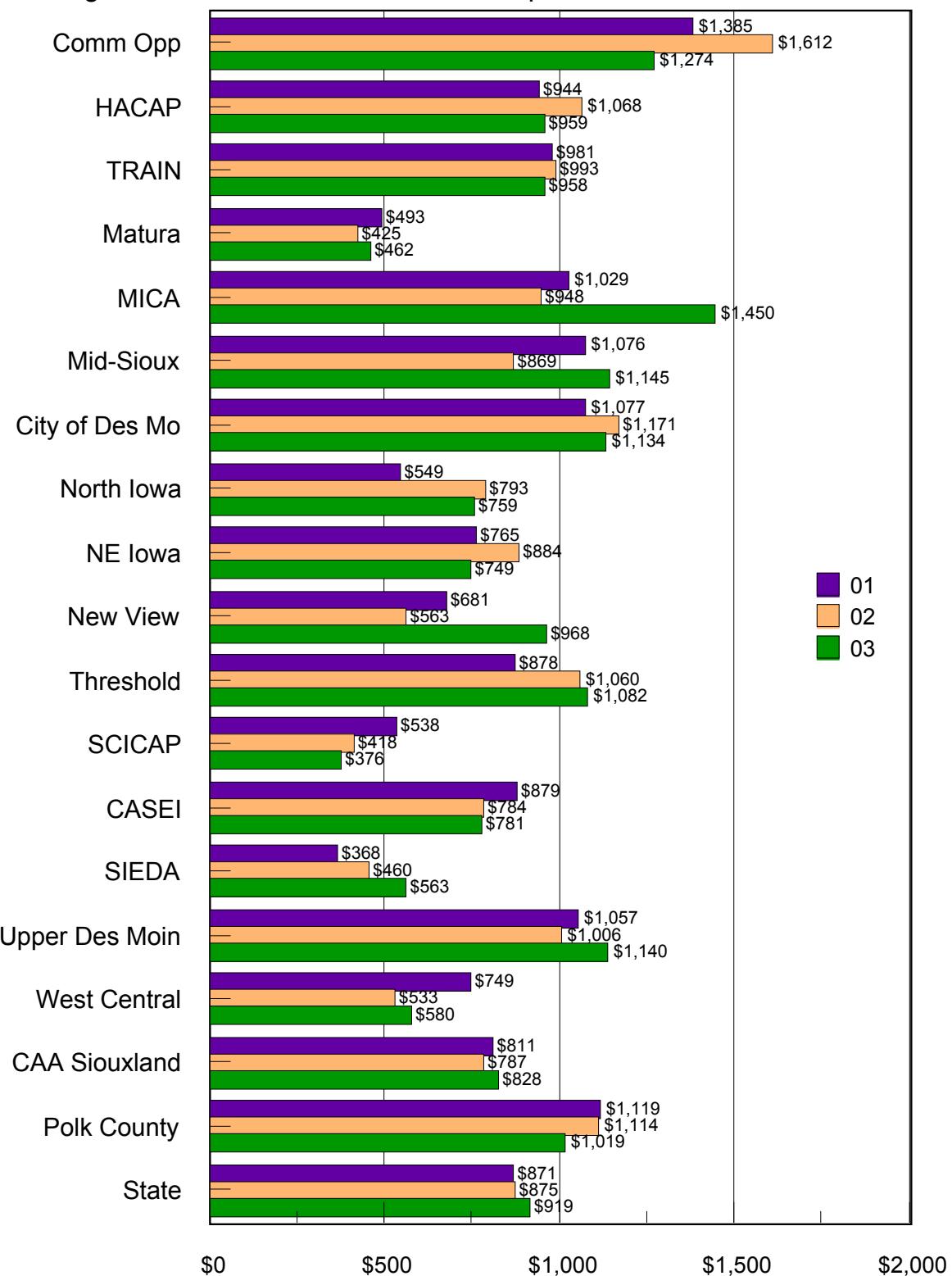


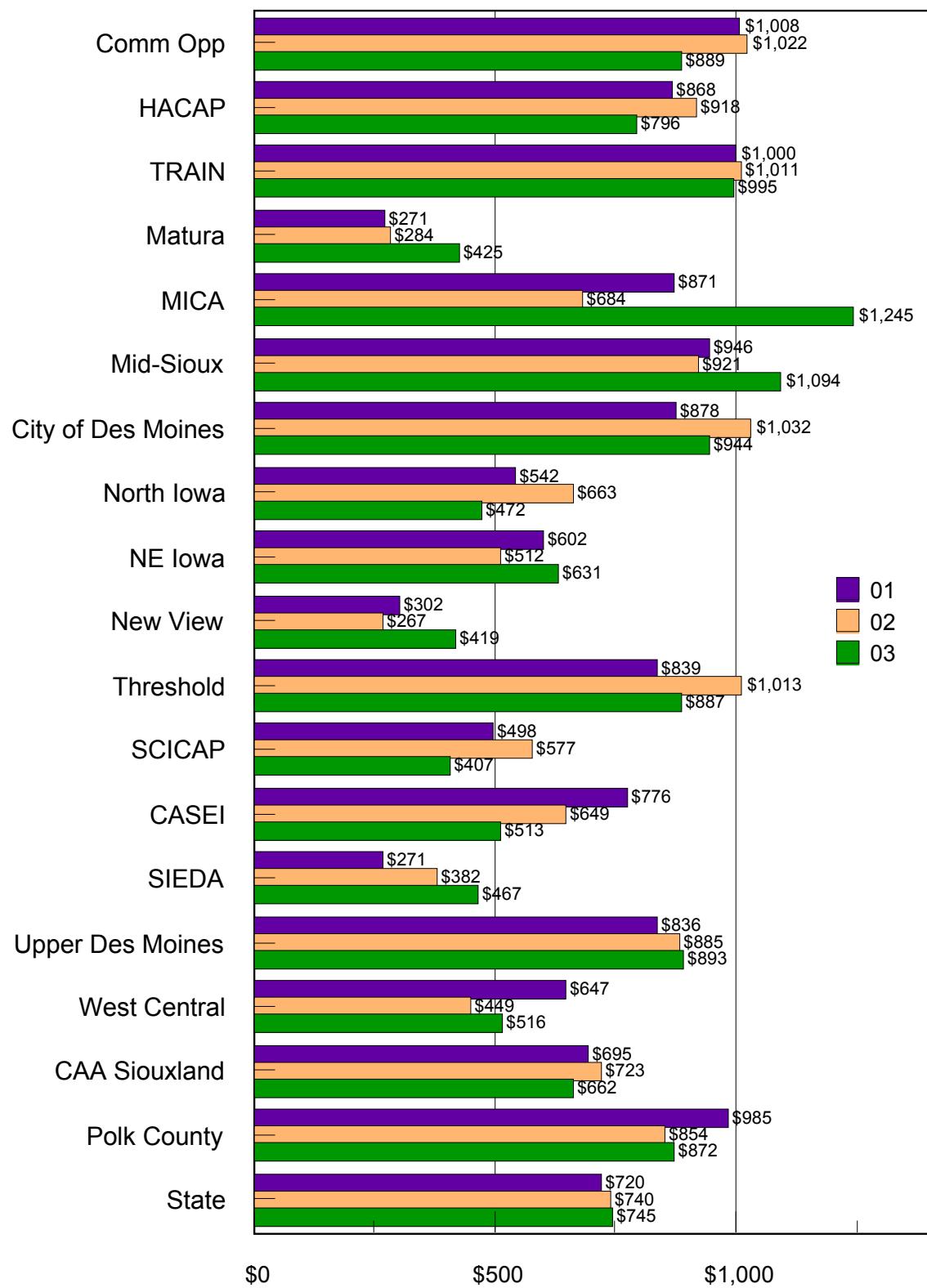
Figure 2.15. Average costs of utility-funded ceiling insulation, by agency.

Average Cost of Wall Insulation -- Dollars per Treated House



**Figure 2.16.** Average cost of wall insulation, by agency.

### Average Cost of Wall Insulation -- Utility Dollars per Treated House



**Figure 2.17. Average cost of utility-funded wall insulation, by agency.**

Average Cost of Floor/Crawlspace Insulation -- Dollars per Treated House

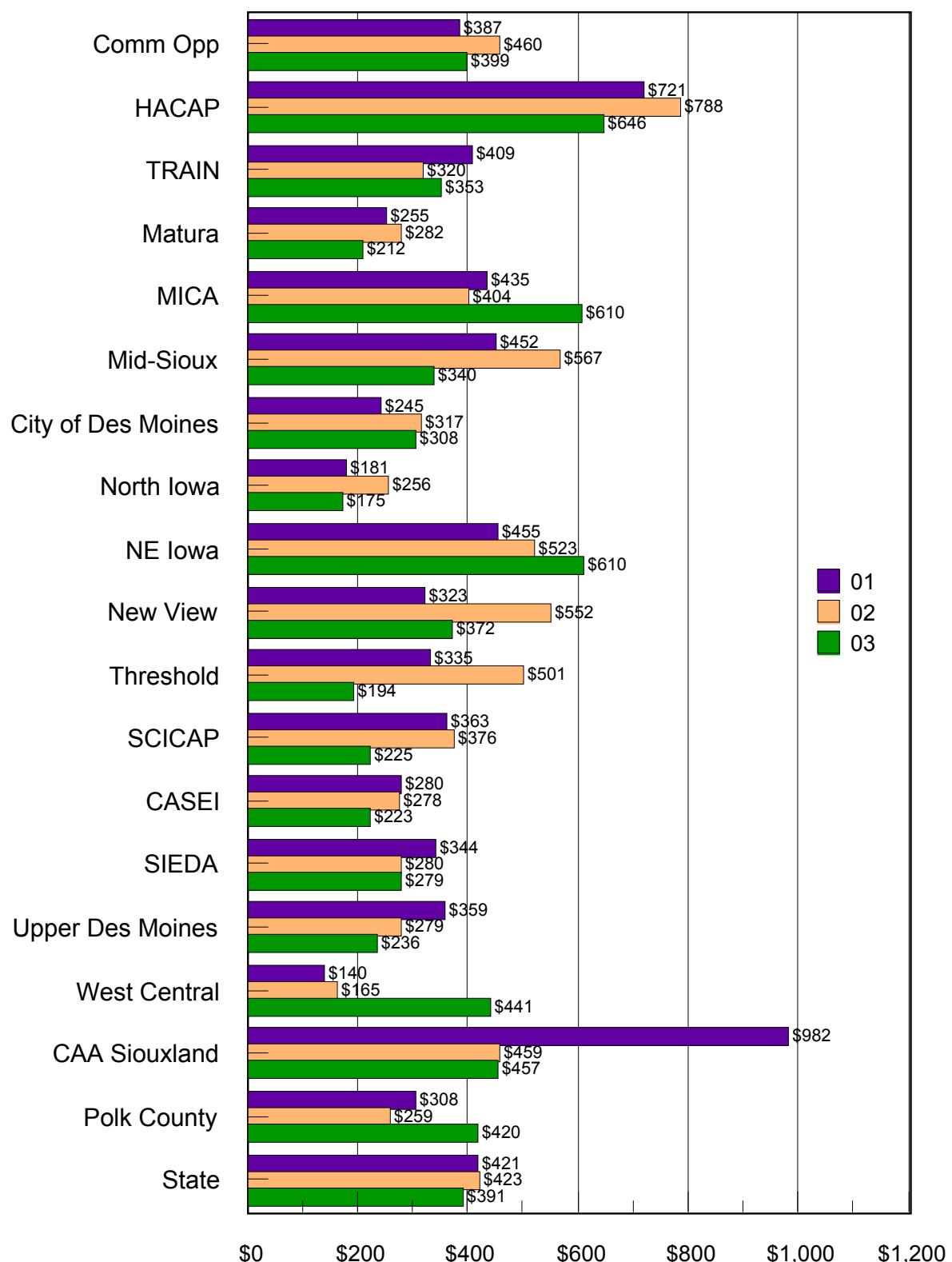
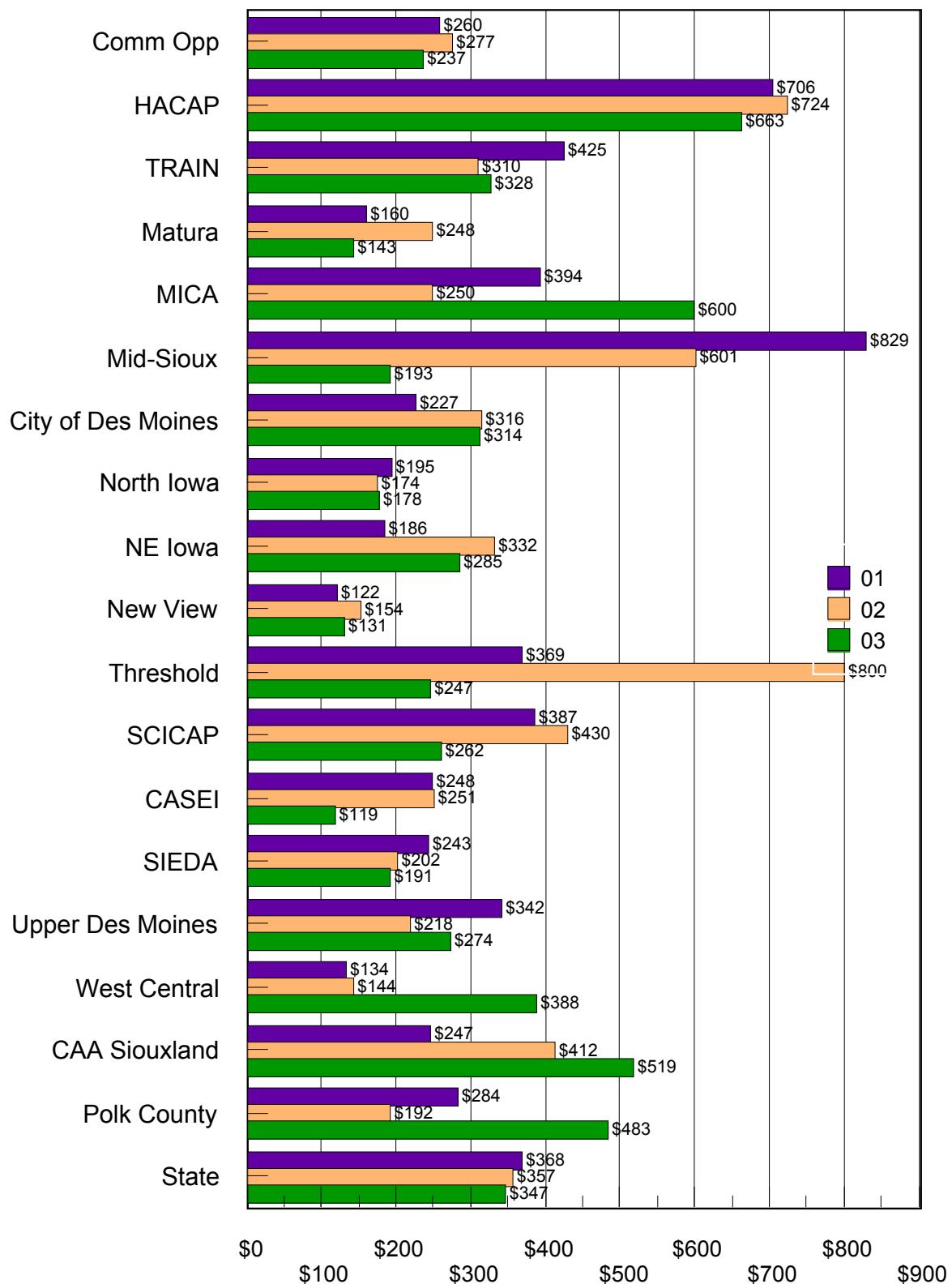


Figure 2.18. Average cost of floor/crawlspace insulation, by agency.

Average Cost of Floor/Crawlspace Insulation --Utility Dollars per Treated House



**Figure 2.19. Average cost of utility-funded floor/crawlspace insulation, by agency.**

Average Furnace Replacement Costs --Dollars per Treated House

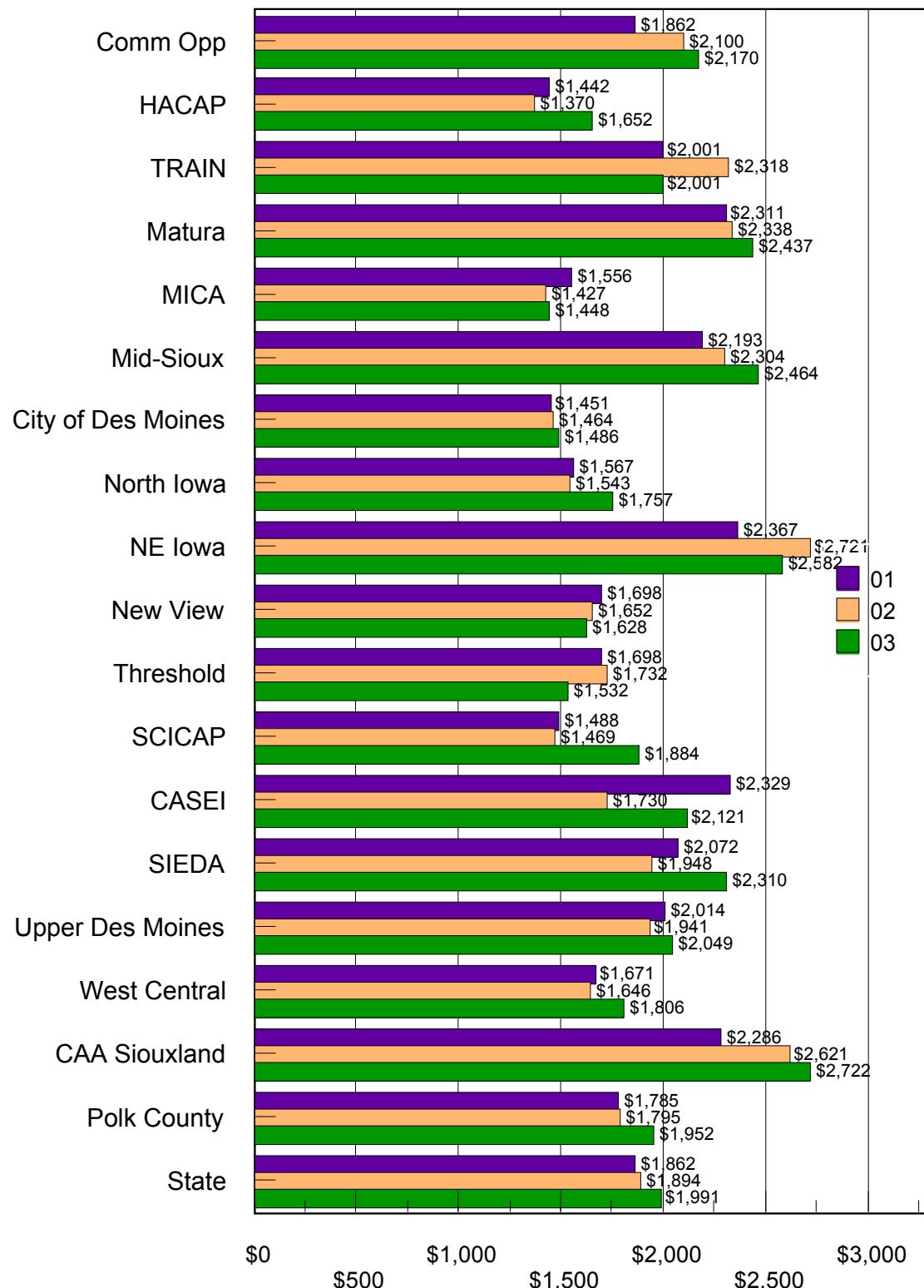
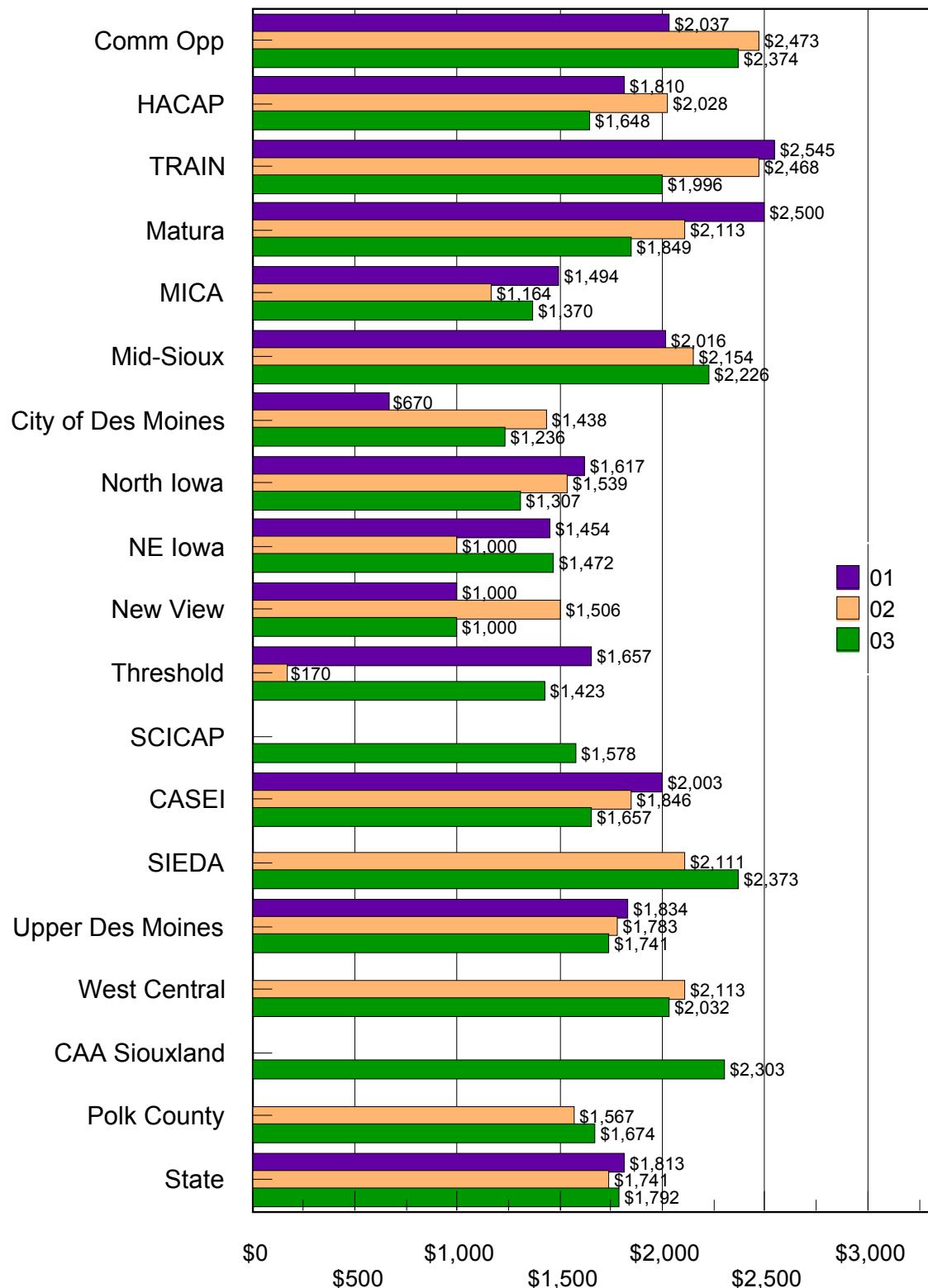


Figure 2.20. Average cost of furnace replacements, by agency.

Average Furnace Replacement Costs --Utility Dollars per Treated House



**Figure 2.21. Average cost of utility-funded furnace replacements, by agency.**



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### **3. FUEL CONSUMPTION ANALYSIS AND ASSESSMENT OF AGENCY-LEVEL SAVINGS ADJUSTMENT FACTORS**

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The 1997 WAP report prompted a change in the methodology for estimating program savings. That study developed information pertaining to the potential error from summarizing agency-level results from the SLICE-algorithm estimates, which were designed for state-level and utility-level reporting. The revised methodology incorporates agency-level adjustment factors for estimated natural gas savings. The adjustment factors are developed annually using weather-normalization analysis of client fuel consumption histories.

In addition to a gas fuel consumption analysis, we conducted an assessment of electricity impacts for the CY 2002 program participants. The objective of the electricity analysis was to develop adjustment factors for refrigeration measure savings: previously the savings were estimated using results of the Iowa Baseload Electricity Efficiency Program pilot evaluation.

#### **Fuel Consumption Analysis of Natural Gas Impacts**

For this study, we developed adjustment factors for each agency using observed savings from a PRISM analysis of natural gas clients with dates of completion from September, 2002 to September 1, 2003. These adjustment factors were applied to estimated natural gas, propane, and fuel oil heating and insulation measures, and to natural gas and propane water heater measures.

We used a comparison group to adjust for non-program factors that could affect energy consumption. We assessed savings for a group of clients with similar characteristics to our treatment group, and netted the change in consumption from this comparison group from the WAP client group savings. In order to assess a change in consumption for the comparison group, we established a pseudo-treatment period for each comparison group household by assigning the same period as that of a randomly selected household from the treatment group.

The comparison group consisted of all LIHEAP clients who were natural gas customers of the SLICE utilities and who applied for energy assistance from October, 2002 through March, 2003. The LIHEAP comparison group had a lower average annual consumption fuel consumption than the WAP client group: to fully account for non-program influences on energy consumption, we scaled the comparison group change for each agency by the ratio of the average energy consumption of the treatment to comparison groups during the pre-treatment period (or pseudo-treatment period in the case of the comparison group).

#### **Methodology**

We assessed impacts for changes in natural gas consumption using the methodology reported in detail in previous studies. Pre- and post-weatherization gas consumption was weather-normalized using PRISM. We used the same ten weather zones that we used in previous studies (Figure 3.1). Our long-term normal datasets for this year's analysis used the 10-year period ending in Dec, 2002.

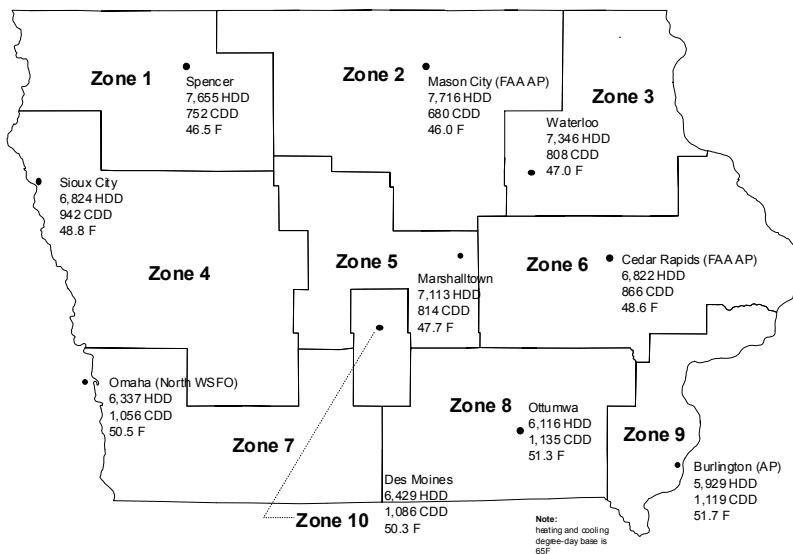


Figure 3.1 Weather zones used for the PRISM analysis

### Study Sample

We used fuel histories immediately preceding and following the treatment period, requiring no less than eight actual readings in each of the pre and post periods, and no more than 390 days total consumption in either pre or post periods, and a period representing no less than 2,000 heating degree days in a typical year. In addition, we required a minimum  $R^2$  of 0.50, a maximum coefficient of variation on NAC of 20.

Of 1,588 client households with gas heating, 933 (59%) and 33,124 comparison group households had sufficient fuel consumption histories to include in our analysis.

### Results

Our results are summarized in Table 3.2.

The key result is the realization rate. The realization rate is defined as the ratio of observed savings to estimated savings. By adjusting our estimated savings for natural gas with these realization rates, we help assure that savings reported for each agency are approximately correct. In this year's study as well as last, we observed that high uncertainty in agency-specific realization rates were in part due to inconsistencies in how an agency reported quantities of insulation. This is an important parameter for estimating savings for wall and ceiling insulation and measures should be taken to assure that they are recorded consistently across all agencies. We implemented routines to correct for inconstant reporting of insulation (e.g., bags vs. pounds) and corroborated square footage with house volume to reduce the uncertainty in estimated savings for any given agency.

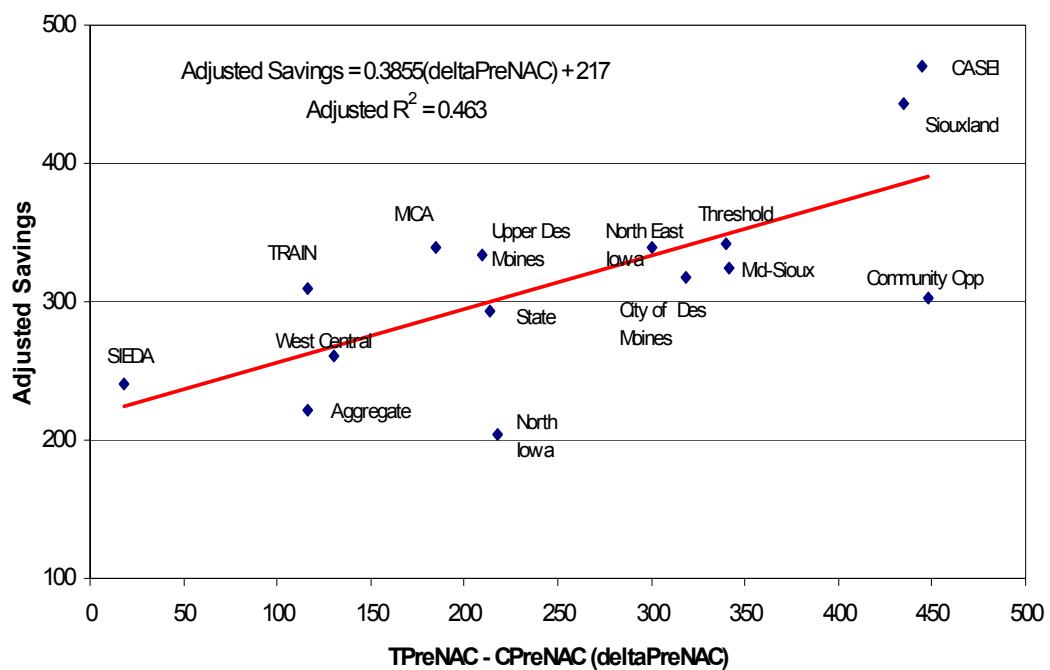
We found relatively high uncertainty in the results for eight agencies, including HACAP, Matura, New View, SCICAP, and Polk County. We aggregated these into a single group in our analysis.

Agency	n (with gas heating source)	Baseline						Baseline						Average						Estimated														
		Cons.		90% CI		Savings (therms)		Cons.		90% CI		Savings (therms)		90% CI		Adjusted Savings (therms)		90% CI		Savings (therms)		90% CI		Realization Rate		Percent Savings		90% CI						
		n	(therms)	90%	CI	Savings	(therms)	90%	CI	90%	CI	Savings	(therms)	90%	CI	90%	CI	90%	CI	90%	CI	90%	CI	90%	CI	90%	CI							
Community Opportunity	41	29	1,388	132	302	72	1,354	940	17	1	12	305	70	364	37	83.9%	16.0%	22.0%	4.7%	26.7%	13.0%	26.7%	2.5%	116.9%	27	10.0%	18.5%	4.0%						
TRAIN	178	92	1,068	79	309	38	3,090	951	14	17	18	286	36	244	27	116.9%	13.0%	26.7%	2.5%	290	42	112.6%	15.2%	28.5%	4.3%	112.6%	42	10.0%	18.5%	4.0%				
MICA	71	39	1,148	94	340	63	1,602	964	45	28	49	327	64	290	42	112.6%	15.2%	28.5%	4.3%	242	45	127.7%	22.3%	24.1%	3.0%	127.7%	45	10.0%	18.5%	4.0%				
Mid-Sioux	44	23	1,283	113	324	47	642	942	23	15	11	309	47	242	45	127.7%	22.3%	24.1%	3.0%	309	47	101.4%	12.3%	24.0%	2.4%	101.4%	21	10.0%	18.5%	4.0%				
City of Des Moines	115	74	1,302	84	318	42	2,987	983	16	-25	21	313	42	309	29	101.4%	12.3%	24.0%	2.4%	313	42	217	27	101.9%	19.0%	309	29	10.0%	18.5%	4.0%				
North Iowa	92	82	1,192	69	205	52	1,688	975	22	11	21	221	53	217	27	101.9%	19.0%	18.5%	4.0%	975	22	101.9%	19.0%	18.5%	4.0%	217	27	10.0%	18.5%	4.0%				
NE Iowa	61	36	1,276	104	339	70	1,392	976	20	53	15	305	65	386	58	79.0%	12.7%	23.9%	4.6%	976	20	386	58	79.0%	12.7%	386	58	10.0%	18.5%	4.0%				
Threshold	114	65	1,347	78	342	59	2,199	1,006	17	14	14	328	56	359	36	91.4%	12.4%	24.3%	3.8%	1,006	17	438	74	394	48	111.1%	12.5%	31.7%	4.7%	359	36	10.0%	18.5%	4.0%
CASEI	73	37	1,383	90	471	77	1,216	938	20	31	13	438	74	394	48	111.1%	12.5%	31.7%	4.7%	938	20	406	66	519	72	78.2%	10.4%	28.6%	4.5%	394	48	10.0%	18.5%	4.0%
SIEDA	95	51	920	84	241	45	1,460	901	17	43	8	202	43	265	43	76.5%	12.9%	22.0%	4.1%	901	17	202	43	265	43	76.5%	12.9%	22.0%	4.1%	265	43	10.0%	18.5%	4.0%
Upper Des Moines	124	88	1,238	71	334	64	2,728	1,029	22	-5	46	321	63	295	28	109.1%	18.8%	26.0%	4.3%	1,029	22	321	63	295	28	109.1%	18.8%	26.0%	4.3%	295	28	10.0%	18.5%	4.0%
West Central	151	113	1,074	71	260	42	3,019	944	30	71	27	231	42	264	23	87.6%	13.6%	21.5%	3.3%	944	30	231	42	264	23	87.6%	13.6%	21.5%	3.3%	264	23	10.0%	18.5%	4.0%
CAA Siouxland	60	32	1,419	101	443	71	1,660	984	16	27	14	406	66	519	72	78.2%	10.4%	28.6%	4.5%	984	16	406	66	519	72	78.2%	10.4%	28.6%	4.5%	519	72	10.0%	18.5%	4.0%
Aggregate	369	172	1,029	51	221	34	7,906	913	9	30	8	194	33	216	19	90.1%	12.6%	18.9%	2.7%	913	9	194	33	216	19	90.1%	12.6%	18.9%	2.7%	216	19	10.0%	18.5%	4.0%
<b>Overall</b>	<b>1,588</b>	<b>933</b>	<b>1,170</b>	<b>23</b>	<b>293</b>	<b>15</b>	<b>33,124</b>	<b>956</b>	<b>5</b>	<b>23</b>	<b>6</b>	<b>271</b>	<b>14</b>	<b>284</b>	<b>9</b>	<b>95.4%</b>	<b>4.0%</b>	<b>23.2%</b>	<b>1.0%</b>															

We found an overall realization rate of 95.4%, indicating a slight overestimate of savings prior to correction. Overall, the program achieved 23.2% savings  $\pm$  1.0% at 90% confidence. Adjusted savings averaged 271 therms per household for our study group. The agency-specific realization rates ranged from 77% ( $\pm$ 13%) to 128% ( $\pm$ 22%).

In previous studies we have emphasized the importance between savings and pre-weatherization energy consumption: in general, higher pre-weatherization consumption yields greater savings. Clients are prioritized for weatherization according to pre-weatherization consumption: consequently we'd expect that agencies that weatherize households that have higher average pre-weatherization consumption compared to the general LIHEAP population will also have the greater savings.

We plotted the relationship between savings and the difference in average energy consumption between the treatment and comparison groups in Figure 3.2.



**Figure 3.2 Savings in relation to the difference between treatment and comparison group energy consumption**

The chart demonstrates the potential savings that can be attained by targeting clients with the highest energy consumption. These findings affirm our previous analysis that concluded targeting the highest usage households increases average household savings substantially. Although we did not analyze this closely in this report, we'd expect that average cost of savings per dollar spent to be less for agencies that target the highest consumption households due to reduced support and inspector/evaluation labor.

### **Fuel Consumption Analysis of Refrigeration Measure Impacts**

The objective of this analysis is to develop adjustment factors for estimated refrigeration measure savings: previously the savings were estimated using results of the Iowa Baseload Electricity Efficiency Program pilot evaluation. The study group in the pilot project consisted of WAP participants with high electricity consumption. The pilot program participants are different from the typical WAP program participant, which are prioritized in large part by estimated heating fuel and electricity savings.

Another key difference between the pilot program and the WAP program is the mechanism for determining replacements. In both cases, the annual consumption is extrapolated from a metering period of approximately 2 hours duration. The pilot project used a consumption threshold of no less than 5 kWh per day for refrigerators and 4 kWh per day for freezers for appliance exchanges. The WAP program allows appliances to be replaced as long as an exchange or a combination of exchange and removal is cost-effective. This should result in more appliance installations, and a lower average savings for the WAP program installations.

Prior to this year, we estimated savings of the WAP program refrigeration measures using the average values determined by the pilot program. Given the differences noted above, we would expect the actual savings attained by the WAP program to be somewhat lower than the pilot program results. The objective of this analysis is to develop adjustment factors which, when applied to the estimated impacts from the pilot study, more reasonably represent the average savings actually attained by the WAP program installations.

### **Methodology**

Our study group consisted of all dwelling weatherized by the WAP program in CY 2002. The WAP program provides measures with both direct and indirect impacts on electricity consumption; consequently we specified our treatment group as any household that received a refrigeration appliance exchange or removal during CY 2002, and all other households treated by the WAP over the same period as the comparison group.

We assessed impacts for changes in electricity consumption using the same general methodology as for the natural gas analysis. Pre- and post-weatherization electricity consumption was weather-normalized using Advanced PRISM, using the automatic model selection feature. We used consumption immediately prior to and after weatherization, requiring no less than 8 months of data and limiting the history to a maximum of 13 months in each period. We used the same ten weather zones that we used in previous studies (Figure 3.1). Our long-term normal datasets for this year's analysis used the 10-year period ending in Dec, 2002.

Electricity consumption is highly discretionary, and not as well linked to temperature as natural gas usage is. In order to limit spuriously high or low values in our PRISM models, we trimmed accounts in the upper and lower 2.5% of normalized annual consumption (NAC). The trim was conducted for each of four separate groups, including the pre- and post-periods from each of the treatment and comparison groups. We were left with 780 total households in our analysis, including 294 in the treatment group and 486 in the comparison group.

Table 3.3 provides a summary of study sample characteristics. The quality of PRISM models were similar, as judged by the average  $R^2$ , around 80% for treatment and comparison groups. The average annual electricity consumption of the treatment group exceeded the comparison group usage by 470 kWh, or about 6%. SLICE estimated savings for non-refrigeration measures were about 75 kWh greater for the treatment group, or less than 1% of annual consumption.

Refrigeration measure savings averaged 1,570 per household for the treatment group. Observed impacts from the PRISM analysis showed savings averaging 883 kWh for the treatment group, and increased consumption of 121 kWh per year for the comparison group<sup>2</sup>.

**Table 3.3 Summary of Study Group Characteristics**

	Treatment	Comparison	Net
<b>Count</b>	294	486	
<b>PRISM Average R2</b>	79%	82%	
<b>PRISM Average pre-NAC</b>	8,711	8,241	
<b>SLICE est. savings (non-refrigeration measures)</b>	472	398	
<b>Estimated refrigeration measure savings</b>	1,570	0	
<b>Observed savings</b>	883	-121	1,004
<b>Realization rate</b>			64%

## Results

We assessed savings using two methods. First, we assessed a single realization rate for all refrigeration measures yielding the 64% realization rate that is shown in Table 3.3. We conducted a bootstrapping procedure to assess the sampling uncertainty on this result: we found the true mean realization rate is between 29% and 99%, at the 90% confidence level.

Next, we conducted a regression analysis to assess specific adjustment factors for each refrigeration measure. These include exchanges of refrigerator and freezers and removals of those appliances.

Our model regressed observed savings against parameters for values of estimated savings of non-refrigeration measures, refrigerator exchanges, freezer exchanges, refrigerator removals, and freezer removals. Using both standard and robust regression techniques, we found the coefficient on estimated savings for non-refrigeration measures was not significant at the 90% level. This indicates that the treatment and comparison group were statistically similar in regards to non-refrigeration measure impacts: this is what we would expect to see in a good comparison group where the only significant difference should be attributable to the study measure.

In addition, we found that refrigerator and freezer removals were not statistically discernable at the 90% confidence level. Consequently, we aggregated these to a single parameter. Robust regression yielded the following results:

Robust regression estimates						Number of obs = 780
						F( 3, 776) = 32.13
						Prob > F = 0.0000
s_	Coef.	Std. Err.	t	P> t	[90% Conf. Interval]	
Removed appl	.5135543	.2414677	2.13	0.034	.1159006	.911208
Exch Refr	.6551026	.0853282	7.68	0.000	.5145824	.7956227
Exch Freezer	.6774213	.1588123	4.27	0.000	.4158861	.9389565
_cons	-30.05546	69.56728	-0.43	0.666	-144.6202	84.5093

<sup>2</sup> Note that the increase in annual electricity consumption by the comparison group does not indicate that the WAP program increased electricity consumption. Electricity consumption is highly discretionary, and many of the factors driving usage (economic factors, humidity, etc.) are not captured by PRISM. We did not conduct a tertiary comparison with a non-WAP group as part of this analysis. Although it would have provided a control for these other factors, it would not have provided additional information for assessing refrigeration measure savings, which is the objective of this study.

The result of our simple assessment of savings, which yielded a 64% realization rate on all refrigeration appliances, is well within the range of coefficients for specific refrigeration appliances from our robust regression, which range from 51.3% for appliance removals to 65.5% and 67.7% for freezer and refrigerator exchanges, respectively. The robust regression model provides statistically significant coefficients for the estimates of appliance savings, so we opted to use these values rather than apply the single realization rate to all refrigeration appliance measures.

Table 3.4 provides a comparison of the pilot and revised refrigeration measure savings.

**Table 3.4. Adjusted Refrigeration Measure Savings**

	Estimated savings (kWh)	
	Pilot	Revised
<b>Refrigerator Exchange</b>	1,327	869
<b>Freezer Exchange</b>	978	662
<b>Refrigerator Removal</b>	1,990	1,022
<b>Freezer Removal</b>	1,389	713



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#### **4. DETAILED SPENDING AND IMPACT PROFILES BY UTILITY**

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This section provides tables of spending and impacts for the utilities, the state, and the overall program. The tables are designed to provide information to meet the filing requirements for cost recovery.

The summary of impacts for state and utility funding are similar to those provided in the earlier SLICE reports.

We have added a second table for each of the utilities in this report. These tables show the combined impacts of electricity and natural gas measures regardless of funding source. These tables should prove useful for the energy and demand planning departments at the utilities to account for the aggregate impacts of the low-income program, and not just the impacts funded by a specific utility.

Energy savings for waterbed mattresses, a measure since the 1994 program, may be negative in these tables. This is because the algorithm accounts for reductions in the heat which the waterbed radiates to the house (which results in more heat required from the heating system). See Appendix A of *An Evaluation of the 1994 Iowa Low-Income Weatherization Efforts* for a detailed description of the algorithm.

In addition, cases where water heater turndowns are the only water heater energy savings measure will show up as negative. The water heater savings algorithms account for interactions between the measures. Because of this, the water heater measure savings are reduced when water heater turndowns are implemented. In the rare instance that a turndown is the only water heater measure installed, the savings show up as negative.

**Combined State and Utility  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

### **Grand Total of Expenditures**

**State Only  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

### Total Reported Materials, Labor, and Support Costs

7,027,049

### **Grand Total of Expenditures**

7,027,049

**Interstate Power and Light Co.  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

**Interstate Power and Light Co.  
Calendar Year 2003 Estimates  
Fuel and Demand Impacts For All Customer Households Regardless of Funding Source**

## **Aquila Networks - PNG Calendar Year 2003 Estimates Costs, Fuel, and Demand Impacts for All Measures**

**Aquila Networks - PNG**  
**Calendar Year 2003 Estimates**

## **Fuel and Demand Impacts For All Customer Households Regardless of Funding Source**

**MidAmerican Energy  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

**MidAmerican Energy**  
**Calendar Year 2003 Estimates**

## Fuel and Demand Impacts For All Customer Households Regardless of Funding Source



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## **5. DETAILED SPENDING AND IMPACT PROFILES BY AGENCY**

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This section provides tables of spending and impacts by agency for all expenditures.

Energy impacts were estimated according to the statewide algorithms, which include agency-specific adjustments beginning this year. See notes regarding waterbed mattress and water heater measure savings at the beginning of Section 4.

**Community Opportunity  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

550,851

### **Grand Total of Expenditures**

550,851

HACAP

#### **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

2,130,294

### **Grand Total of Expenditures**

2,130,294

Dalhoff and Associates

## TRAIN

#### **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

1,860,095

### **Grand Total of Expenditures**

1,860,095

Matura

#### **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

540,237

**Grand Total of Expenditures**

540,237

Dalhoff and Associates

MICA

**ICSA**  
**Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

Measure	Number of Households with Impacts						Count of Households with Electricity Impacts by End-Use						Estimated First-Year Savings										Average Estimated First Year Measure Cost and Savings																
													Spending on Materials & Labor (\$)			Electricity			Gas			Spending on Materials & Labor (\$)			Electricity			Gas			Propane			Fuel Oil			Other		
	Total	Electric	Gas	Propane	Fuel Oil	Other	Total	Electric	Gas	Cooling	Heating	kW	kWh	kW	kWh	Annual kWh	Pk-Day thrm	Gas thrm	Propane gallons	Fuel Oil gallons	Other Mbtu	Summer kW	kWh	kW	kWh	Annual kWh	Pk-Day thrm	Gas thrm	Propane gallons	Fuel Oil gallons	Other Mbtu								
OVERALL	82	82	75	5	2	0	597,854	23.8	66.3		237,413	469	46,282	4,516	751	0	7290.91	0.146	0.377	2,895	6,251	617	903	375	-														
82	82	71	5	2	0	67	80					538,634	10.6	12,401	44.8	71,434	83,835	463	44,184	4,487	751	0	6568.71	0.159	185	0.560	893	1,022	6,517	622	897	375	-						
Wall Insul.	52	52	43	5	2	0	38	52				150,751	0.04	48	15.01	23,940	23,988	152	14,581	1,535	240	0	2899.07	0.001	1	0.289	460	461	3,546	339	307	120	-						
Ceiling Insul.	70	70	60	5	2	0	55	70				121,419	9.95	11,610	11.77	18,725	30,335	89	8,482	714	110	0	1734.56	0.181	211	0.168	267	433	1,481	141	143	55	-						
Infl. Reduction	82	69	70	5	2	0	67	4				135,117	0.44	509	10.56	16,840	17,349	92	8,769	930	311	0	1647.77	0.007	8	2.639	4,210	251	1,313	125	186	156	-						
Found./Crave. Insul.	39	39	35	1	1	0	31	39				47,569	0.21	234	6.56	10,500	10,733	44	4,232	36	77	0	1219.72	0.007	8	0.168	269	275	1,263	121	36	77	-						
Bandjopist Insul.	47	47	40	3	1	0	-	47				14,284	0.00	0	0.90	1,430	1,430	6	604	47	12	0	303.90	-	-	0.019	30	30	0.150	15	16	12	-						
Hi-Eff Htg Sys Repl.	19	0	16	3	1	0	-	0				58,044	0.00	0	0.00	0	0	0	66	6,335	1,224	0	3054.94	-	-	-	-	-	4,155	396	408	-	-						
Sle-Eff Htg Sys Repl.	5	0	5	0	0	0	-	0				11,450	0.00	0	0.00	0	0	0	12	1,181	0	0	2290.03	-	-	-	-	-	2,479	236	-	-	-						
Electric Htg Sys Repl.	0	0	0	0	0	0	-	0				0	0.00	0	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-							
Other Htg Sys Repl.	0	0	0	0	0	0	-	0				0	0.00	0	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-							
Number of Measures by Fuel Type																																							
Water Heating	Total	Electric	Gas	Propane	Fuel Oil	Other	Total	Electric	Gas	Propane	Fuel Oil	Other		Summer kW	Winter kW	Annual kWh	Pk-Day thrm	Annual thrm	Propane gallons	Fuel Oil gallons	Other Mbtu	Summer kW	Winter kW	Annual kWh	Pk-Day thrm	Annual thrm	Propane gallons	Fuel Oil gallons	Other Mbtu										
Temp. Reduct.	77	18	58	1	0	0	260	68	186	6	0	0	7,693	0.0	0.6	27,937	8.8	2,531	97	0	0	99.91	0.000	0.032	1,552	0.152	44	97	-	-	-	-	-						
WH Wrap	0	0	0	0	0	0						0	0.00	0.00	0	0	0	0	0	0	0	99.91	-	-	-	-	-	-	-	-	-	-							
Pipe Insul.	62	14	48	0	0	0						808	0.00	0.01	2,754	1.6	568	0	0	0	0	13.03	0.000	0.000	197	0.034	12	-	-	-	-	-	-	-	-				
LF Showerhead	36	9	26	1	0	0	72	18	52	2	0	0	451	0.00	0.44	19,504	4.1	1,251	85	0	0	12.54	0.000	0.049	2,167	0.156	48	85	-	-	-	-	-	-	-	-			
Pauli Aerati	54	14	39	1	0	0	174	48	122	4	0	0	553	0.00	0.08	3,570	0.9	286	13	0	0	10.25	0.000	0.006	255	0.024	7	13	-	-	-	-	-	-	-	-			
Sle-Eff Wh Htr Repl.	7	1	6	0	0	0	14	2	12	0	0	0	5,884	0.00	0.05	2,110	2.2	426	0	0	0	840.06	0.000	0.052	2,110	0.363	71	-	-	-	-	-	-	-	-	-			
Hi-Eff Wh Htr Repl.	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-								
Lighting	78	78		874	874			4,101	4.1	7.6		39,323	-	-	-	-	-	-	-	-	-	52.58	0.053	0.098	504	-	-	-	-	-	-	-	-	-					
Capsize (42W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Capsize (52W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Capsize (72W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Capsize, unknown	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (5W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (7W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (9W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (11W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (15W)	78	78		874	874		4,101	4.13	7.63		39,323	-	-	-	-	-	-	-	-	-	52.58	0.053	0.098	504	-	-	-	-	-	-	-	-	-						
CFL (18W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-							
CFL (20W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (23W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (25W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL (30W)	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
CFL, unknown	0	0		0	0		0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Refrigerated Mattress Pad	9	9	7	1	0	0	34	15	14	2	0	0	330	0.0	0.0	4,79	-4.34	-67.7	0.0	0.0	3,726	0.000	0.533	1,405	-0.376	-62	-68	-	-	-	-	-	-	-	-	-	-		
King	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Queen	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Double	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Single	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-							
Unknown	9	9	7	1	0	0	34	18	14	2	0	0	338	0.00	4.79	12,649	-2.6	-434	-67.7	0.0	0.0	37.56	0.000	0.533	1,405	-0.376	-62	-68	-	-	-	-	-	-	-	-	-		
Refrigerator/Freezer	37	37			90	90		47,088	9.06	8.47		73,670	-	-	-	-	-	-	-	-	-	1272.65	0.245	0.229	1,991	-	-	-	-	-	-	-	-	-	-				
Refrigerator Removal	0	0			0	0		0	0.00	0.00	0	0	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-						
Refrigerator Exchange	34	34			68	68		37,854	7.27	6.80		59,104	-	-	-	-	-	-	-	-	-	1113.35	0.214	0.200	1,738	-	-	-	-	-	-	-	-	-	-				
Freezer Removal	0	0			0	0		0	0.00	0.00	0	0	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-						
Freezer Exchange	11	11			22	22		9,234	1.79	1.68		14,566	-	-	-	-	-	-	-	-	-	839.46	0.163	0.152	1,324	-	-	-	-	-	-	-	-	-	-				
Costs for Measures Without Energy Impacts Installed in 82 Total Households with Spending and/or Energy Impacts:</td																																							

**Total Reported Materials, Labor, and Support Costs**

1.000.612

**Grand Total of Expenditures**

1,000,612

Mid-Sioux

#### **Mid-Clouds** **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

663,934

### **Grand Total of Expenditures**

663,934

**City of Des Moines**  
**Calendar Year 2003 Estimates**  
**Costs, Fuel, and Demand Impacts for All Measures**

Measure	Number of Households with Impacts						Count of Households with Electricity Impacts by End-Use						Estimated First-Year Savings						Average Estimated First Year Measure Cost and Savings Average per Treated Household												
	Total		Electric	Gas	Propane	Fuel Oil	Other	Cooling		Heating		Spending on Materials & Labor (\$)		Electricity		Gas		Pk-Day		Gas		Spending on Materials & Labor (\$)		Electricity		Gas					
	Total	Electric	Gas	Propane	Fuel Oil	Other	KW	kWh	KW	kWh	Annual kWh	therms	Propane gallons	Fuel Oil gallons	Other Mbtu	KW	kWh	Annual kWh	therms	Propane gallons	Fuel Oil gallons	Other Mbtu	KW	kWh	Annual kWh	therms					
<b>OVERALL</b>	<b>112</b>	<b>112</b>	<b>112</b>	<b>0</b>	<b>0</b>	<b>0</b>					<b>687,916</b>	<b>39.0</b>	<b>31.8</b>	<b>201,086</b>	<b>801</b>	<b>73,410</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6142.11</b>	<b>0.312</b>	<b>0.265</b>	<b>1,795</b>	<b>7,150</b>	<b>655</b>	<b>-</b>	<b>-</b>	<b>-</b>			
Shell & Htg. Sys.	112	111	111	0	0	0	111	106	594,137	19.8	23,888	13.3	20,101	43,989	790	71,386	0	0	0	5304.79	0.178	215	0.125	190	396	7,121	643	-	-		
Wall Insul.	90	90	90	0	0	0	90	90	204,136	8.42	10,156	8.37	12,666	22,822	338	30,566	0	0	0	2268.18	0.094	113	0.093	141	254	3,761	340	-	-		
Ceiling Insul.	95	95	95	0	0	0	95	95	139,939	12.50	15,075	3.00	4,537	19,611	119	10,740	0	0	0	1473.04	0.132	159	0.032	48	206	1,252	113	-	-		
Infl. Reduction	111	111	110	0	0	0	111	1	96,736	1.12	1,351	0.75	1,129	2,480	140	12,663	0	0	0	871.50	0.010	12	0.746	1,129	22	1,275	115	-	-		
Found/Crawl. Insul.	37	37	37	0	0	0	37	37	22,806	2.23	(2,694)	1.03	1,554	(1,140)	41	3,664	0	0	0	616.38	-0.060	(73)	0.028	42	(31)	1,097	99	-	-		
Bathtub Sealant	29	29	29	0	0	0	-	29	5,639	5.00	0	0.14	215	5	438	0	0	0	198.16	-	0.005	7	7	0.167	15	-	-				
Hi-Eff Htg Sys Repl.	14	0	14	0	0	0	-	0	40,352	0.00	0	0.00	0	0	62	5,624	0	0	0	282.29	-	-	-	-	4,448	402	-	-			
Std Eff Htg Sys Repl.	24	0	24	0	0	0	-	0	76,902	0.00	0	0.00	0	0	73	6,637	0	0	0	3204.25	-	-	-	-	3,062	277	-	-			
Electric Htg Sys Repl.	0	0	0	0	0	0	-	0	0	0.00	0	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-				
Other Htg Sys Repl.	4	0	4	0	0	0	-	0	7,600	0.00	0	0.00	0	0	12	1,053	0	0	0	1900.00	-	-	-	-	2,916	263	-	-			
Water Heating	Number of Measures by Fuel Type						Summar						Summer						Summer						Water						
	Total	Electric	Gas	Propane	Fuel Oil	Other	Total	Electric	Gas	Propane	Fuel Oil	Other	KW	kWh	Annual kWh	Pk-Day therms	Annus therms	Propane gallons	Fuel Oil gallons	Other Mbtu	KW	kWh	Annual kWh	Pk-Day therms	Annus therms	Propane gallons	Fuel Oil gallons	Other Mbtu	Water	kW	therms
Temp. Reduct.	62	0	62	0	0	0	56	0	56	0	0	0	20,941	0.0	0.0	0	10.4	2,024	0	0	0	337.76	-	-	-	-	0.167	33	-	-	-
WH Wrap	0	0	0	0	0	0	-	0	0	0.00	0.00	0	0	0	0	0	0	0	0	0.00	-	-	-	-	0.070	24	-	-	-		
Drip Seal	1	0	1	0	0	0	-	0	20	0.00	0.00	0	0	0	0	0	0	0	0	0.00	-	-	-	-	0.053	12	-	-	-		
Lf Showerhead	46	0	46	0	0	0	4	0	4	0	0	0	2,080	0.00	0.00	0	1.5	533	0	0	0	45.22	-	-	-	-	0.072	22	-	-	-
Faucet Aerato	2	0	2	0	0	0	12	0	12	0	0	0	60	0.00	0.00	0	0.1	45	0	0	0	30.00	-	-	-	-	0.034	10	-	-	-
Std-Eff Wtr Hr Repl.	20	0	20	0	0	0	40	0	40	0	0	0	18,671	0.00	0.00	0	0.1	31	0	0	0	36.67	-	-	-	-	0.426	70	-	-	-
Hi-Eff Wtr Hr Repl.	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
<b>Lighting</b>	<b>14</b>	<b>14</b>	<b>90</b>	<b>90</b>	<b>0</b>	<b>0</b>	<b>1,193</b>	<b>0.6</b>	<b>1.1</b>	<b>5,875</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>85.18</b>	<b>0.044</b>	<b>0.081</b>	<b>420</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>		
Capsite (42W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
Capsite (52W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
Capsite (72W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
Caplate, unknown	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL (6W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL (7W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL (9W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL (11W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL (15W)	6	6	26	26	0	0	345	0.12	0.23	1,170	-	-	-	-	-	-	-	-	57.42	0.020	0.038	195	-	-	-	-	-	-			
CFL (18W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL (20W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL (23W)	3	3	12	12	0	0	159	0.08	0.16	804	-	-	-	-	-	-	-	-	53.00	0.028	0.052	268	-	-	-	-	-	-			
CFL (25W)	8	8	52	52	0	0	689	0.11	0.17	3,902	-	-	-	-	-	-	-	-	85.13	0.051	0.095	488	-	-	-	-	-	-			
CFL (30W)	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
CFL unknown	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
<b>Waterbed Mattress Pad</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
King	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
Queen	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
Double	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
Single	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
Unknown	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-		
<b>Refrigerator/Freezer</b>	<b>70</b>	<b>70</b>	<b>182</b>	<b>182</b>	<b>0</b>	<b>0</b>	<b>71,646</b>	<b>18.60</b>	<b>17.39</b>	<b>151,221</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1023.51</b>	<b>0.256</b>	<b>0.248</b>	<b>2,160</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>			
Refrigerator Removal	7	7	14	14	0	0	192	0.16	0.04	14,292	-	-	-	-	-	-	-	-	72.00	0.261	0.245	2,042	-	-	-	-	-	-			
Refrigerator Exchange	65	65	132	132	0	0	60,3																								

**North Iowa  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

#### Total Reported Materials, Labor, and Support Costs

1.054.553

### **Grand Total of Expenditures**

1,054,553

NE Iowa

#### **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

1.012.459

**Grand Total of Expenditures**

1,012,459

## New View

## **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

620,721

**Grand Total of Expenditures**

620,721

Dalhoff and Associates

## Threshold

#### **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

1,154,350

### **Grand Total of Expenditures**

1,154,350

SCICAP

## **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

386,581

**Grand Total of Expenditures**

386,581

Dalhoff and Associates

**CASEI**  
**Calendar Year 2003 Estimates**  
**Costs, Fuel, and Demand Impacts for All Measures**

Measure	Number of Households with Impacts						Count of Households with Electricity Impacts by End-Use						Estimated First-Year Savings						Average Estimated First Year Measure Cost and Savings Average per Treated Household																									
													Spending on Materials & Labor (\$)		Electricity		Gas		Gas		Pk-Day therms		Propane		Fuel Oil		Other		Spending on Materials & Labor (\$)		Electricity		Gas		Gas		Pk-Day therms		Propane		Fuel Oil		Other	
	Total	Electric	Gas	Propane	Fuel Oil	Other	Cooling	Heating	Summer kW	Winter kW	Annua kWh	Pk-Day therms	Annua gallons	Propane gallons	Fuel Oil gallons	Other Mbtu	Summer kW	Winter kW	Annua kWh	Pk-Day therms	Annua gallons	Propane gallons	Fuel Oil gallons	Other Mbtu	Summer kW	Winter kW	Annua kWh	Pk-Day therms	Annua gallons	Propane gallons	Fuel Oil gallons	Other Mbtu												
<b>OVERALL</b>	82	82	72	8	0	0			627,824	34.8	45.5	171,439	716	63,920	10,267	0	0	7656.39	0.236	0.295	2,091	9,942	888	1283	-	-																		
Shell & Htg. Sys.	81	81	72	8	0	0	74	81	570,615	23.7	27,186	32.3	48,237	75,423	710	62,381	9,995	0	0	7044.63	0.321	367	0.399	596	931	9,857	866	1249	-	-														
Wall Insul.	68	68	60	8	0	0	62	68	106,207	11.30	12,885	6.05	8,929	21,813	227	19,981	2,920	0	0	1561.86	0.182	208	0.089	131	321	3,788	333	365	-	-														
Ceiling Insul.	80	80	71	8	0	0	73	80	107,317	11.78	13,518	11.42	17,091	30,609	89	7,867	1,463	0	0	1341.46	0.161	185	0.143	214	383	1,260	111	183	-	-														
Infl. Reduction	81	74	71	8	0	0	74	1	174,429	0.21	231	13.47	20,233	20,464	197	17,291	2,261	0	0	2153.45	0.003	3	13,472	20,233	277	2,772	244	283	-	-														
Found/Crawl. Insul.	28	28	24	4	0	0	26	28	12,488	0.47	552	1.33	1,959	2,511	36	3,184	2,163	0	0	445.98	0.018	21	0.047	70	90	1,510	133	541	-	-														
Bathtub Insul.	4	4	2	2	0	0	-	4	484	0.00	0	0.02	26	0	0	32	38	0	0	12,045	-	0.004	6	6	16	19	-	-	-	-	-	-												
Hi-Eff Htg Sys Repl.	36	0	33	3	0	0	-	0	145,900	0.00	0	0.00	0	0	0	147	12,935	1,151	0	0	40,191	-	-	-	-	4,465	392	364	-	-														
Std Eff Htg Sys Repl.	4	0	0	4	0	0	-	0	24,182	0.00	0	0.00	0	0	0	12	1,077	0	0	6045.50	-	-	-	-	3,058	269	-	-	-	-	-	-	-											
Electric Htg Sys Repl.	0	0	0	0	0	0	-	0	0	0.00	0	0.00	0	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-														
Other Htg Sys Repl.	0	0	0	0	0	0	-	0	0	0.00	0	0.00	0	0	0	0	0	0.00	-	-	-	-	-	-	-	-	-	-	-	-														
					</																																							

**SIEDA**  
**Calendar Year 2003 Estimates**  
**Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

1,032,396

### **Grand Total of Expenditures**

1,032,396

**Upper Des Moines  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

1.324.345

### **Grand Total of Expenditures**

1,324,345

Dalhoff and Associates

### **West Central Calendar Year 2003 Estimates**

**Total Reported Materials, Labor, and Support Costs**

1,498,920

### **Grand Total of Expenditures**

1,498,920

**CAA Siouxland  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

684,150

**Grand Total of Expenditures**

684,150

**Polk County  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for All Measures**

**Total Reported Materials, Labor, and Support Costs**

652,178

**Grand Total of Expenditures**

652,178



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## **6. DETAILED SPENDING AND IMPACT PROFILES BY AGENCY FOR UTILITY EXPENDITURES**

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This section provides tables of spending and impacts by agency for utility expenditures.

Note that the same considerations for reporting at the agency level hold for this set of tables as for the ones in the previous section (see the discussion at the beginning of the previous section.) See notes regarding waterbed mattress pad and water heater measure savings at the beginning of Section 4..

## **Community Opportunity Calendar Year 2003 Estimates Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

HACAP

## **Calendar Year 2003 Estimates**

**Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

## **TRAIN** Calendar Year 2003 Estimates Costs, Fuel, and Demand Impacts for Utility-Funded Measures

MATURA

#### **Calendar Year 2003 Estimates**

Costs, Fuel, and Demand Impacts for Utility-Funded Measures

**MICA**  
**Calendar Year 2003 Estimates**  
**Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**Total Reported Materials, Labor, and Support Costs**

113,376

**Grand Total of Expenditure:**

113,376

79

**Mid-Sioux  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**City of Des Moines  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**North Iowa  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

#### Total Reported Materials, Labor, and Support Costs

87,998

**Grand Total of Expenditure**

87,998

**NE Iowa  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

## **New View Calendar Year 2003 Estimates Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**Threshold  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

SCICAP

**Calendar Year 2003 Estimates**

**Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**CASEI**  
**Calendar Year 2003 Estimates**  
**Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

### Total Reported Materials, Labor, and Support Costs

126,978

**Grand Total of Expenditure**

126,978

SIEDA

#### **Calendar Year 2003 Estimates**

## **Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**Upper Des Moines  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**West Central  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

#### Total Reported Materials, Labor, and Support Costs

170,063

**Grand Total of Expenditure**

170,063

CAA Siouxland

SDA Siouxland  
Calendar Year 2003 Estimates

## **Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**Polk County  
Calendar Year 2003 Estimates  
Costs, Fuel, and Demand Impacts for Utility-Funded Measures**

**Total Reported Materials, Labor, and Support Costs**

64,997

**Grand Total of Expenditures**

64,997



## APPENDIX A -- CLIENT CHARACTERISTICS

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Household characteristics</b>												
Quarterly gross inco	\$2,305	\$2,338	\$2,455	\$2,655	\$2,693	\$2,759	\$2,987	\$2,834	\$3,285	\$3,488	\$3,282	\$3,363
Average members		2.9	2.8	2.7	2.7	2.7	2.7	2.5	2.5	2.6	2.6	2.6
Percentage of households with:												
Elderly	9.5	29.2	34.8	35.8	37.2	37.9	40.7	42.0	42.4	42.5	38.9	
Handicapped	7.2	25.7	30.6	34.0	37.1	36.8	41.6	44.0	49.6	47.6	47.3	
Young children	18.7	14.6	20.1	22.1	19.3	20.1	17.8	18.0	18.0	NA	15.8	
<b>Housing type (%)</b>												
Single family home	84.2	88.0	88.7	87.9	87.7	90.3	88.5	85.0	92.0	91.3	92.4	92.9
Mobile home	6.3	4.7	5.3	5.4	6.6	5.6	6.9	8.4	7.0	7.4	7.4	5.8
Duplex	1.7	2.6	3.1	1.9	2.7	1.6	1.2	2.6	0.0	1.3	0.0	0.4
Three+ unit apartm.	5.1	4.5	1.9	1.3	0.4	0.8	0.9	1.3	0.0	0.0	0.1	0.9
Rent a room	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown/other	2.0	0.1	1.1	3.5	2.6	1.7	2.6	2.6	1.0	0.0	0.0	0.0
<b>Heating system type (%)</b>												
Natural gas	72.4	70.7	75.0	76.1	80.0	82.4	80.7	81.1	81.0	85.2	84.5	85.5
Propane	14.5	14.3	15.4	13.7	13.4	11.8	13.6	11.9	14.0	11.2	11.8	11.4
Fuel oil	5.3	5.8	5.1	4.3	3.3	3.8	2.1	2.1	3.0	1.9	1.4	1.4
Electricity	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.2	85.5
Other	7.7	9.1	4.4	5.9	3.3	2.0	3.5	4.8	2.0	0.1	0.0	0.0
<b>Air conditioning type (%)</b>												
Central	25.5	23.1	21.6	24.7	27.6	30.5	32.9	31.6	39.0	40.0	41.6	44.1
Room	30.3	29.3	42.5	41.3	44.6	41.3	43.9	45.7	46.0	46.4	44.5	39.4
None	44.2	47.6	34.6	34.0	27.8	28.3	23.2	22.7	16.0	13.6	13.9	16.5
<b>Blower door readings (average cfm50)</b>												
Pre	3,710	3,370	3,455	3,521	3,595	3,487	3,403	3,356	3,191	3,531	3,555	3,642
Post	2,174	2,164	2,296	2,296	2,334	2,337	2,261	2,377	2,443	2,302	2,341	2,348

